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Analysis of Respirator Cartridge Performance Testing on a Hanford AN Tank Farm Exhauster Slipstream

March 2017

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Executive Summary

Washington River Protection Solutions (WRPS) conducted tests using two types of chemical cartridges for use in air purifying respirators (APR) to determine the period of time that the cartridges would provide adequate performance for APRs to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from vapors exiting the exhausters at the Hanford AN tank farms. The Occupational Safety and Health Administration (OSHA) identifies cartridge testing as a valid approach for establishing a cartridge service life. Testing is commonly applied in situations where mixtures of COPCs exist, and where other approaches, such as manufacturer recommendations and modeling, are less reliable. The tests were designed and conducted to assure measurement and/or control of the key variables OSHA identified as important to estimate cartridge service life, including temperature, humidity, COPC concentration, breathing rate, and cartridge adsorption capacity.

Testing was conducted from September 30–October 2, 2016, on a slipstream from the AN Exhauster under static conditions fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges, SCOTT 7422-SD1 and SCOTT 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were assessed on separate days. Sample media (sorbent tubes) were used to collect samples of the vapor stream entering and exiting the respirator cartridge, and were subsequently analyzed for COPC concentrations. Pacific Northwest National Laboratory was tasked with conducting an independent analysis of the analytical results and making recommendations based on the results for respiratory cartridge performance and service life. The key conclusions from the analysis are described below:

- Based on measured cartridge inlet vapor concentrations from the AN Exhauster, three COPCs, ammonia, N-Nitrosodimethylamine (NDMA), and N-Nitrosomethylethylamine (NMEA), exceeded their corresponding Occupational Exposure Limits (OEL).¹ Four COPCs—mercury, 2,5-dihydrofuran, N-Nitrosodiethylamine (NDEA), and N-Nitrosomorpholine—reported one or more inlet concentration measurements greater than 10% of their corresponding OEL, but less than 100%. All other COPC inlet and outlet measurements did not exceed 10% of their OELs.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 130% of the OEL (32.5 ppm), which was significantly lower than the maximum historical measurement of 536% of its OEL from the AN Exhauster. For both cartridges, ammonia appeared to breakthrough above 10% of its OEL after 10 hours. The inlet ammonia concentrations were relatively consistent at the beginning of the campaign for both cartridges. However, a significant decrease in ammonia inlet concentrations was observed at the 12- and 14-hour measurements for the SCOTT 7422-SD1 cartridge, which could be due to analytical or flow measurement error.
- Cartridge inlet concentration measurements for NDMA reached 4589% of its OEL (13.7 ppb), which was significantly lower than maximum and average historical measurements from the AN Exhauster; that is 85667% and 8033% of the OEL, respectively. However, all outlet concentrations were less than the analytical reporting limit of 13% of the OEL, indicating no breakthrough for either cartridge.

¹ Occupational Exposure Limits accepted for Hanford Tank Farm use are based on OELs established by a U.S. governmental agency or national professional organization (e.g., OSHA, National Institute for Occupational Safety and Health, American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs using non-U.S. exposure limits, other established OELs for chemical surrogates when available, or other standard procedures. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Cartridge inlet concentrations for NMEA reached 106% of its OEL (0.32 ppb), which was lower than maximum and average historical measurements from the exhauster of 285% and 125%, respectively. However, all outlet concentrations were less than the analytical reporting limit of approximately 10% of the OEL, indicating no breakthrough for either cartridge.
- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant between 10% and 12% of the OEL, with two exceptions where the concentration decreased to less than the detection limit (DL) in one test, and increased to a maximum of 16% of the OEL in the other test. Overall, inlet concentrations of mercury during cartridge testing were substantially lower than average and maximum historic AN Exhauster measurements of approximately 200% and 1800% of the OEL, respectively. Mercury outlet concentrations during this study were all below the DL, indicating no breakthrough for the testing period.
- Maximum NDEA inlet concentrations for both cartridges were observed during the first 6 hours of each test, and ranged from 43% to 71% of the OEL. Inlet concentrations for the remainder of each test were less than the DL. All of the respirator outlet measurements were below the DL, indicating no breakthrough for either cartridge.
- N-Nitrosomorpholine inlet concentrations reached a maximum of approximately 33% of the OEL early in each test, before decreasing at later sample times. All outlet concentrations were less than the DL, indicating no breakthrough for either cartridge.
- The inlet concentration for 2,5-dihydrofuran reached a maximum of approximately 11% of the OEL in testing with the SCOTT 7422-SD1 cartridge. However, the majority of inlet measurements for both cartridges were at or near the analytical DL. All outlet concentrations for both cartridges were less than the DL, indicating no breakthrough for either cartridge.

Based on the measurements taken for this study, ammonia breakthrough, above 10% of its OEL, occurred after 10 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). Inlet concentrations of ammonia remained relatively constant with an average of 118% of the OEL (29.5 ppm) up through the 10-hour sample period. This experimental result supports a 10-hour service life for the use of SCOTT 7422-SC1 and 7422-SD1 cartridges in APRs employed to protect workers at the Hanford AN tank farm, under the same conditions as those tested. Additional respirator cartridge and respirator selection evaluations by Industrial Hygiene professionals are recommended to determine proper respiratory protection requirements. Variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact the experiment-derived cartridge service life, especially if OEL thresholds are exceeded. Historic concentrations from the AN exhauster for a number of COPCs including ammonia, mercury, and NDMA were substantially higher than cartridge testing inlet concentrations, and should be carefully considered. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of APR applicability and an appropriate respirator cartridge change-out schedule for adequate worker protection.

Acronyms and Abbreviations

ALS	ALS Environmental Salt Lake City
APR	Air Purifying Respirator
CAS	Chemical Abstract Service
CBAL	Columbia Basin Analytical Laboratory, part of the RJ Lee Group
CFR	Code of Federal Regulations
COPC	Chemicals of Potential Concern
CVAA	Cold Vapor Atomic Absorption
DL	Detection Limit
EPA	U.S. Environmental Protection Agency
GC–FID	Gas Chromatography–Flame Ionization Detector
GC/MS	Gas Chromatography/Mass Spectrometry
GC–TEA	Gas Chromatography–Thermal Energy Analyzer
HPLC	High Performance Liquid Chromatography
HPLC–UV	High Performance Liquid Chromatography–Ultraviolet
IC	Ion Chromatography
IH	Industrial Hygiene
NDEA	N-Nitrosodiethylamine
NDMA	N-Nitrosodimethylamine
NIOSH	National Institute of Occupational Safety and Health
NMEA	N-Nitrosomethylethylamine
OEL	Occupational Exposure Level
OSHA	Occupational Safety and Health Administration
SCBA	Self-Contained Breathing Apparatus
ppm	Parts Per Million
PNNL	Pacific Northwest National Laboratory
RL	Reporting Limit
SAR	Supplied Air Respirator
SCBA	Self Contained Breathing Apparatus
SWIHD	Site-Wide Industrial Hygiene Database
TIC	Tentatively Identified Compound
TWINS	Tank Waste Information Network System
VOC	Volatile Organic Compound
WC	Water Column
WHL	Wastren Hanford Laboratory (222S)
WRPS	Washington River Protection Solutions

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1.0 Introduction/Project Description

As the Tank Operations Contractor for U.S. Department of Energy operations at the Hanford site, Washington River Protection Solutions (WRPS) is responsible for managing highly radioactive wastes stored in tanks at Hanford. WRPS recently identified the need to test air purifying respirator (APR) chemical cartridges commonly used at Hanford Tank Farms. The tests were conducted to determine the period of time that the cartridges would provide adequate performance for APRs used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from any vapors exiting headspaces in the tanks. Occupational Safety and Health Administration (OSHA) Standard 29 Code of Federal Regulations (CFR) 1910.134(d)(3)(iii)(b)(2) specifies that for protection against gases and vapors, employers shall implement a schedule for cartridges to ensure that change-outs occur before the end of service life.[1-4] The change schedule can be based on objective information or data that ensure cartridge change-outs occur before the end of their service life.[2-5] The primary function of the WRPS APR Cartridge Test Program is to obtain objective data to determine service lives for APR cartridges in use at Hanford Tank Farms. WRPS contracted Pacific Northwest National Laboratory (PNNL) to analyze the test data and offer an independent analysis and any recommendations. This report summarizes data analyses of cartridge testing on vapors from the AN Exhauster on the Hanford AN double-shell tank farms.

2.0 Regulatory Requirements

2.1 Background on Regulatory Requirements

OSHA Respiratory Protection Standard (29 CFR 1910.134) mandates/requires that employers provide protective equipment, including respirators, to their employees to protect them against potential exposure to contaminants at or above documented Occupational Exposure Limits (OEL) and establish cartridge change-out schedules to ensure cartridges are changed before the end of service life.[1] End of service life is the time when a respirator cartridge can no longer filter/capture harmful contaminants (i.e., the cartridge no longer functions effectively).

Protective respirator cartridges are frequently used in workplaces with low contaminant concentrations, and where respirators provide essential protection for longer periods of time (greater than 2 hours). If the contaminant concentration in a workplace is high, supplied air respirators (SAR) or self-contained breathing apparatuses (SCBA) must be used to provide additional protection. While the use of SARs or SCBAs offers more protection, a tradeoff exists, particularly for SCBAs that employ a large, heavy (~30 pounds), back-mounted compressed air cylinder.[1]

2.2 OSHA-Approved Methods for Determining Cartridge Change-Out Times

The National Institute of Occupational Safety and Health (NIOSH) certifies organic vapor cartridges using the criteria in 42 CFR 84, Approval of Respiratory Protective Devices. Still, there is no widely accepted, standard protocol for performing service-life testing.[4] However, OSHA has identified three valid approaches for establishing cartridge service lives.[3] These approaches are described below.

- *Conduct experimental tests* – First, gather all available information about the nature of all contaminants present in the workplace. Obtain breathing rates of workers and estimate worst-case exposures. For most employers, this approach is the most time consuming, and resources needed to perform these tests may not be available. If an employer has the resources needed to pursue this approach, it is the most reliable method of estimating cartridge service life. Concentrations at different points in time are obtained using actual respirator cartridges exposed to actual or simulated gases to gather service-life information. A safety factor that includes the assumptions made, variable factors, or conditions needs to be applied to the service life and used in the respiratory protection program. This approach is commonly used in situations where mixtures of contaminants are present and can also be used to validate an existing cartridge change-out schedule.
- *Use the manufacture's recommendation* – Once information about airborne contaminants (including concentrations, temperature, and humidity) has been obtained, contact the manufacturer of the respirator to be used and provide all the information. Manufacturers should be able to provide the estimated service life of different cartridges for particular compounds. Manufacturers should also be able to provide the exact objective information they used to project the service life. Using the information obtained, service lives are proposed. This approach is not as reliable as conducting application-specific experiments, and manufacturers may not have all the information for workplace hazards and user factors. If any safety factor is applied considering all the variable factors, it must be clearly identified in the respiratory protection program. For complex mixtures such as those present in the storage tanks at Hanford, manufacturer recommendations may be of limited value, and experimental testing is recommended.

- *Use mathematical models* – Mathematical models are usually applicable for single contaminant exposure situations. OSHA and NIOSH have worked over the years with researchers and industrial partners to develop mathematical models for predicting respirator cartridge service life.[3, 5-11] OSHA offers guidance on using mathematical models to estimate respirator cartridge service life based on single components, but the models have not been adopted for mixtures. NIOSH has developed a computer tool for estimating breakthrough times and service lives of respirator cartridges. Manufacturers can use those results to make service-life recommendations for their particular product (canister/cartridge) in multi-gas environments. Two types of mathematical models are used: 1) predictive models [3, 5-7] and 2) descriptive models.[9] Each model has its own mathematical basis for its estimations. To estimate the service lives of cartridges, the following information is needed:

- the number of cartridges used by the respirator
- the mass of the sorbent used in each cartridge
- the carbon micro-pore volume
- the density of the packed bed
- the maximum temperature
- the maximum relative humidity
- the maximum concentration of the contaminants and the work (volumetric flow) rate.

The primary advantages of using mathematical models are that they are relatively inexpensive and take little time. However, the estimates are not as accurate as testing; sometimes modeling might result in a service-life estimate that is shorter than it needs to be because of conservative assumptions used during calculations.

In addition to the methods described above, “rules of thumb” can be allowed as part of the overall workplace organic vapor assessment for determining a cartridge change-out schedule. Chapter 36 of the American Industrial Hygiene Association publication, *The Occupational Environment: Its Evaluation and Control and Management*, outlines the approach.[12] The “rules of thumb” may not work for every chemical or situation, but can provide an estimate of cartridge life. The following are rules of thumb outlined in the publication:

- If the compound’s boiling point is $>70^{\circ}\text{C}$ and the concentration is <200 ppm, a service life of 8 hours at a normal work rate can be expected.
- Service life is inversely proportional to worker breathing rate.
- Reducing the concentration of a contaminant by a factor of 10 will increase service life by a factor of 5.
- Relative humidity above 85% will reduce the service life by 50%.

These rules of thumb do not apply in certain situations, including for mixtures of hazardous contaminants (e.g., Hanford Tank Farm vapors) and inorganic gases such as ammonia, sulfur dioxide, and hydrogen sulfide, compositions that vary with time, location, and contaminants that undergo continuous reactions. However, some of the general drivers can help in interpreting the results obtained from experimental testing of respirator cartridges.

3.0 Description of Testing Program

Based on the OSHA guidance described in the previous section, a sample testing approach was pursued for quantifying respirator cartridge effectiveness for Hanford tank vapors. WRPS developed a sampling approach outlined in TFC-PLN-168, “Industrial Hygiene Sampling and Analysis Plan for Respirator Cartridge Testing,” and “Air Purifying Respirator Cartridge Test Apparatus, RPP-STE-59226.”[13,14]

Appendix A provides a description of the respirator cartridge testing setup developed by WRPS and used for measurements of vapors from the AN primary exhausters.[13-15] The test system and methodology were developed in consultation with recognized subject matter experts to follow the example of tank farm headspace field sampling for the purposes of cartridge testing.

The Sampling and Analysis Plan was developed under the direction and oversight of the Industrial Hygienist in conjunction with the Tank Farms Operations Contractor Retrieval and Closure, and Tank Farms Project and/or Production Operations Project Management Team, as applicable. Trained Industrial Hygiene Technicians under the direction of a qualified Industrial Hygienist collected chemical vapor samples from the influent and effluent sides of the cartridge test apparatus. Training was performed at HiLine Engineering (Richland, Washington) on the test stands for WRPS Sampling Equipment Operators, Industrial Hygiene Technicians, and the Field Work Supervisors, prior to transport of the stands to tank farms.

The APR cartridge test assembly was designed and constructed to operate to the following environmental conditions without negatively impacting system performance:

- Temperature: 32 to 115°F
- Relative Humidity: 5% to 100%
- Precipitation: Up to 4 inches in 6 hours
- Wind: Up to 20 mph with blowing dust.

To ensure the cartridges effectively protect the worker, WRPS developed a testing program with the following conservative conditions:

- The flow rate through each cartridge was set at 30 L/min (equivalent to 60 L/min for a pair of cartridges), which corresponds to more than twice the normal breathing rate and is slightly higher than OSHA recommended testing flow rate of 53.3 L/ min.[3,5]
- Tank farm vapors source sampling was performed on headspace vapors rather than from Hanford Tank Farm atmospheric concentrations (i.e., source sampling vs. the breathing zone).
- 10% OEL for each COPC was considered as a threshold concentration.

Using the cartridge testing setup shown in Appendix A, separate test surveys were performed on two NIOSH-approved respiratory protection twin cartridges: SCOTT 7422-SD1 for Survey 1, and SCOTT 7422-SC1 for Survey 2.[16] These cartridges were chosen because they are suitable for capturing organic vapors, acid gases, ammonia, formaldehyde, and particulates.[16]

Vapor concentrations upstream and downstream of the APR cartridge were monitored with an array of sorbent tubes (see Appendix B). Influent (upstream) concentrations were measured at the beginning and end of each 16-hour verification survey. Downstream sorbent tubes were changed out every 2 hours until the experiment was finished. A measured quantity of sample air was drawn in through the sorbent tube (see Appendix A).[13,14] Compounds from the sorbent tubes were extracted and analyzed using analytical methods referenced in Appendix B.

The characteristics of 59 COPCs were the primary focus of the testing. The 59 COPCs represent a set of tank vapor chemicals found in a tank farm source greater than 10% of their OELs, or are considered “known” or “probable” carcinogens by the International Agency for Research Cancer or other regulatory agencies.[17,18] A full listing of these COPCs is shown in Section 4.0.

4.0 Data Analysis

Respirator cartridge testing on the AN primary exhauster was conducted from September 30–October 2, 2016. Each cartridge was tested for approximately 16 hours of continuous run time. Testing and analysis focused on the 59 COPCs identified in Table 1 and other hazardous airborne contaminants. Sorbent tubes were changed every 2 hours, and more than 200 sorbent tubes were sent to the 222S Laboratory at Hanford and dispositioned for analysis. Appendix C lists the raw data for all of contaminants analyzed during the tests, and Appendix D lists the corresponding calculated concentrations. Appendix C also gives the average temperatures of the sample slipstream during testing, which ranged from 57 to 79°F, and the average relative humidity ranged from 61 to 83%. Table 1 provides an overview of the results for each of the 59 COPCs. Note that nitrous oxide was not analyzed as it is not susceptible to respirator filtration, and there are no known NIOSH-approved respirator filtration cartridges approved for nitrous oxide. Additionally, methanol was not quantified as part of the COPC data set because it is used as a standard solvent and calibration standard in the analytical procedure for volatile organic compounds (VOC).

Table 1 shows the measured concentrations in the current study for all of the COPCs tested. Inlet concentrations of three COPCs—ammonia, N-Nitrosodimethylamine (NDMA) and N-Nitrosomethylethylamine (NMEA)—exceeded their corresponding OELs. The inlet (or outlet) concentrations of four additional COPCs were lower than their corresponding OELs but still exceeded 10%. These COPCs were mercury, 2,5-dihydrofuran, N-Nitrosodiethylamine (NDEA), and N-Nitrosomorpholine. All seven of the aforementioned COPCs are highlighted in yellow in Table 1. All seven COPCs identified above with measured concentrations or DLs exceeding 10% of their respective OELs are assessed in more detail in Section 5.0. Appendix E shows similar detailed assessments for an additional eight COPCs with respirator cartridge inlet (or outlet) concentrations or DLs less than 10% of the OEL but greater than 2%. These COPCs were 1,3-butadiene, formaldehyde, furan, 2,3-dihydrofuran, 2-pentylfuran, acetonitrile, ethylamine, and dibutyl butylphosphonate. All of the other COPCs had inlet (or outlet) concentrations less than 2% of their OELs or their detection limits (DL).¹

¹ The term “detection limit” is used here to refer either to analytical reporting limit (RL) or DL. The use of either an RL or a DL varied among analytical laboratories. An RL (equivalent to a limit of quantification) was used instead of an analytical method DL by several laboratories for specific COPC analyses. See Appendix C and Appendix F for additional information on the specific use of RLs or DLs for each COPC.

Table 1. Summary of Analyzed COPCs

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Inorganic						
1 Ammonia	7664-41-7	32.5 ppm	25 ppm	2.59%		Up to 130% of OEL for inlet values. All outlets <36%.
2 Nitrous Oxide	10024-97-2	Not Measured	50 ppm			
3 Mercury	7439-97-6	4.10 ug/m3	25 ug/m3	7.25%		Up to 16.4% of OEL for inlet values. All outlets <DL.
Hydrocarbons						
4 1,3-Butadiene	106-99-0	0.0215 ppm	1 ppm	2.15%	X	
5 Benzene	71-43-2	0.0003 ppm	0.5 ppm	0.027%		Up to 0.063% of OEL for inlet values. All outlets <DL.
6 Biphenyl	92-52-4	0.0012 ppm	0.2 ppm	0.602%	X	
Alcohols						
7 1-Butanol	71-36-3	0.0378 ppm	20 ppm	0.004%		Up to 0.19% of OEL for inlet values. All outlets <0.02%.
8 Methanol	67-56-1	Not Measured	200 ppm			
Ketones						
9 2-Hexanone	591-78-6	0.0002 ppm	5 ppm	0.004%		Up to 0.004% of OEL for inlet values. All outlets <DL.
10 3-Methyl-3-butene-2-one	814-78-8	Not Detected	0.02 ppm	TIC ²	X	
11 4-Methyl-2-hexanone	105-42-0	0.0002 ppm	0.5 ppm	0.032%		Up to 0.047% of OEL for inlet values. All outlets <DL.
12 6-Methyl-2-heptanone	928-68-7	Not Detected	8 ppm	TIC	X	
13 3-Buten-2-one	78-94-4	0.0009 ppm	0.2 ppm	0.096%		Up to 0.45% of OEL for inlet values. All outlets <DL.
Aldehydes						
14 Formaldehyde	50-00-0	0.0131 ppm	0.3 ppm	0.623%		Up to 4.4% of OEL for inlet values. All outlets <0.8%.
15 Acetaldehyde	75-07-0	0.0151 ppm	25 ppm	0.005%		Up to 0.06% of OEL for inlet values. All outlets <0.04%.
16 Butanal	123-72-8	0.0005 ppm	25 ppm	0.001%		Up to 0.002% of OEL for inlet values. All outlets <0.002%.
17 2-Methyl-2-butenal	1115-11-3	Not Detected	0.03 ppm	TIC	X	
18 2-Ethyl-hex-2-enal	645-62-5	Not Detected	0.1 ppm	TIC	X	

¹ Approximate DL is calculated using the reported DLs (or RL) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.

² Tentatively Identified Compound (TIC) indicates that a mass spectrometry “peak” not associated with calibrated compounds has been tentatively assigned to a compound based on an adequate match to the analytical methods reference library. Reference standards for the compound are not available to accurately quantify, assign an analytical DL, or definitively confirm the identity of the TIC. TICs are reported when the peak area is sufficiently large, estimated as ≥5 nanograms of TIC mass, and other analytical criteria are met. For the respirator cartridge testing, this mass of TIC represents an approximate concentration of <1.0 ppb, based on the average of all TICs in the COPC list.

Table 1. (continued)

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Furans						
19 Furan	110-00-9	0.06 ppb	1 ppb	5.81%	X	
20 2,3-Dihydrofuran	1191-99-7	0.03 ppb	1 ppb	3.11%	X	
21 2,5-Dihydrofuran	1708-29-8	0.11 ppb	1 ppb	4.38%		Up to 10.7% OEL for inlet values. All outlets <DL.
22 2-Methylfuran	534-22-5	0.02 ppb	1 ppb	1.25%		
23 2,5-Dimethylfuran	625-86-5	0.02 ppb	1 ppb	1.84%	X	Up to 1.3% OEL for inlet values. All outlets <1.6%.
24 2-Ethyl-5-methylfuran	1703-52-2	Not Detected	1 ppb	TIC	X	
25 4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	Not Detected	1 ppb	TIC	X	
26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	Not Detected	1 ppb	TIC	X	
27 2-Pentylfuran	3777-69-3	0.03 ppb	1 ppb	1.43%		Up to 3.1% of OEL for inlet values. All outlets <2.0%.
28 2-Heptylfuran	3777-71-7	0.02 ppb	1 ppb	1.56%		All inlets <DL. All outlets <1.6%.
29 2-Propylfuran	4229-91-8	0.013 ppb	1 ppb	1.30%	X	
30 2-Octylfuran	4179-38-8	Not Detected	1 ppb	TIC	X	
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	Not Detected	1 ppb	TIC	X	
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not Detected	1 ppb	TIC	X	
Phthalates						
33 Diethylphthalate	84-66-2	0.0133 mg/m ³	5 mg/m ³	0.266%	X	
Nitriles						
34 Acetonitrile	75-05-8	1.20 ppm	20 ppm	0.001%		Up to 1.2% of OEL for inlet values. All outlets <6.0%.
35 Propanenitrile	107-12-0	0.0004 ppm	6 ppm	0.004%		Up to 0.005% of OEL for inlet values. All outlets <0.008%.
36 Butanenitrile	109-74-0	0.0002 ppm	8 ppm	0.003%		Up to 0.002% of OEL for inlet values. All outlets <DL.
37 Pentanenitrile	110-59-8	0.0002 ppm	6 ppm	0.007%		Up to 0.007% of OEL for inlet values. All outlets <DL.
38 Hexanenitrile	628-73-9	0.0002 ppm	6 ppm	0.003%	X	
39 Heptanenitrile	629-08-3	Not Detected	6 ppm	TIC	X	
40 2-Methylene butanenitrile	1647-11-6	Not Detected	0.3 ppm	TIC	X	
41 2,4-Pentadienenitrile	1615-70-9	Not Detected	0.3 ppm	TIC	X	

Table 1. (continued)

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Amines						
42 Ethylamine	75-04-7	0.1467 ppm	5 ppm	0.096%		Up to 2.9% of OEL for inlet values. All outlets <DL.
Nitrosamines						
43 N-Nitrosodimethylamine	62-75-9	13.8 ppb	0.3 ppb	12.7%		Up to 4589% of OEL for inlet values. All outlets <DL.
44 N-Nitrosodiethylamine	55-18-5	0.07 ppb	0.1 ppb	25.7%		Up to 70.8% of OEL for inlet values. All outlets <DL.
45 N-Nitrosomethylethylamine	10595-95-6	0.32 ppb	0.3 ppb	9.93%		Up to 106% of OEL for inlet values. All outlets <DL.
46 N-Nitrosomorpholine	59-89-2	0.20 ppb	0.6 ppb	3.61%		Up to 32.9% of OEL for inlet values. All outlets <DL.
Organophosphates						
47 Tributyl phosphate	126-73-8	0.98 ppb	200 ppb	0.488%	X	
48 Dibutyl butylphosphonate	78-46-6	0.67 ppb	7 ppb	9.52%	X	
Halogenated						
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m ³	TIC	X	
50 2-Fluoropropene	1184-60-7	Not Detected	0.1 ppm	TIC	X	
Pyridines						
51 Pyridine	110-86-1	0.46 ppb	1000 ppb	0.036%		Up to 0.05% of OEL for inlet values. All outlets <DL.
52 2,4-Dimethylpyridine	108-47-4	0.27 ppb	500 ppb	0.054%	X	
Organonitrites						
53 Methyl nitrite	624-91-9	Not Detected	0.1 ppm	TIC	X	
54 Butyl nitrite	544-16-1	Not Detected	0.1 ppm	TIC	X	
Organonitrates						
55 Butyl nitrate	928-45-0	Not Detected	2.5 ppm	TIC	X	
56 1,4-Butanediol, dinitrate	3457-91-8	Not Detected	0.05 ppm	TIC	X	
57 2-Nitro-2-methylpropane	594-70-7	Not Detected	0.3 ppm	TIC	X	
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	Not Detected	0.05 ppm	TIC	X	
Isocyanates						
59 Methyl Isocyanate	624-83-9	Not Detected	20 ppb	TIC	X	

5.0 Plots of COPCs with Significant Detected Values

Of the 59 COPCs in Table 1, only three COPCs, ammonia, NDMA, and NMEA, exceeded their OELs. Four additional COPCs—mercury, 2,5-dihydrofuran, NDEA, and N-Nitrosomorpholine—had inlet concentrations less than their corresponding OEL levels but greater than 10% (see COPCs highlighted in yellow in Table 1). This section provides more detail on these seven COPCs, along with plots of the corresponding data. Note that Appendix E shows plots and descriptions for other COPCs with measured concentrations or DLs between 2% and 10% of their corresponding OELs.

Ammonia (see Figure 1) – The DL for ammonia corresponds to approximately 2.6% of the OEL. The inlet ammonia concentrations were relatively consistent between 100% and 130% of the OEL at the beginning of the campaign for both cartridges, but decreased after 10 hours, for SCOTT 7422-SD1 to 11% before returning to approximately 120% of the OEL by the end of testing. This sudden decrease and increase in ammonia concentration is likely a result of analytical error or flow rate measurement error. Outlet concentrations for both cartridges exceeded the DL midway through the test, and exceeded 10% of the OEL after 10 hours.

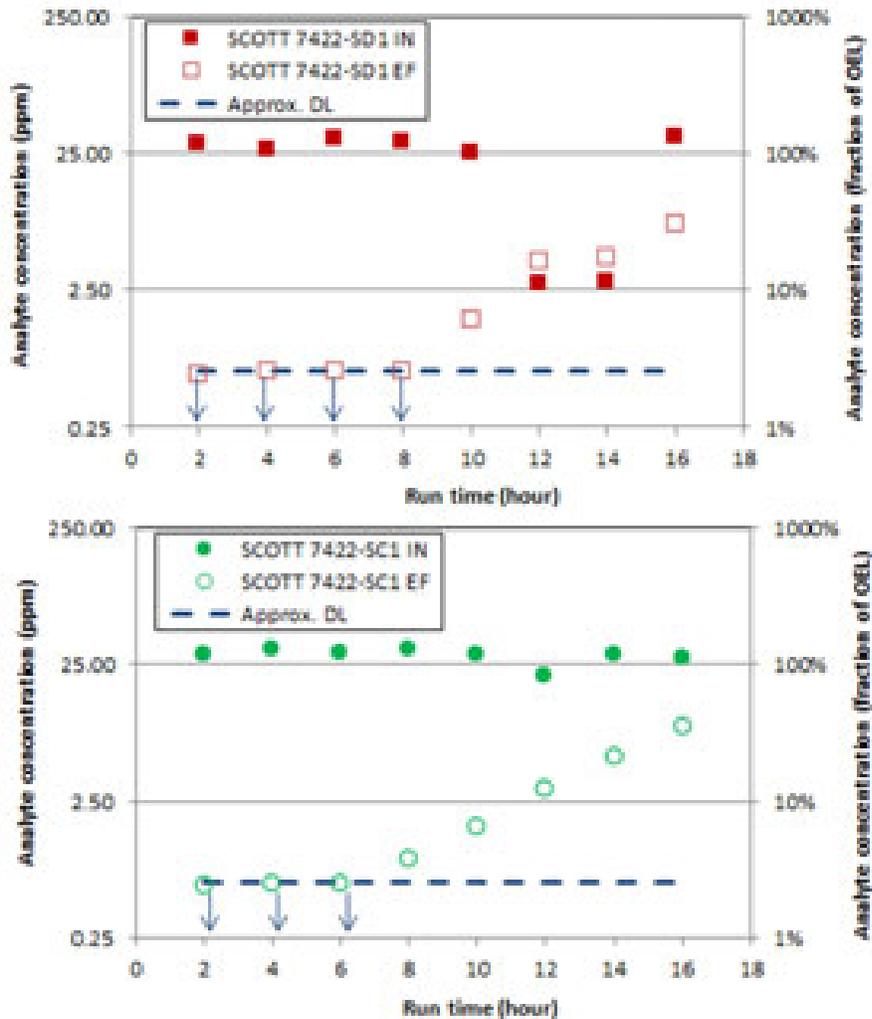


Figure 1. Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Mercury (see Figure 2) – The DL for mercury corresponds to approximately 7.3% of the OEL. Inlet concentrations measured throughout the testing period for SCOTT 7422-SD1 and SCOTT 7422-SC1 cartridges remained relatively consistent between 10% and 12% of the OEL, with only two exceptions. There was a decrease in concentration to less than the DL at 14 hours for SCOTT 7422-SD1, and the final, 16-hour inlet concentration for SCOTT 7422-SC1 increased to a maximum of 16.4% of the OEL. All outlet concentrations were below the DL, indicating no evidence of breakthrough over the measured time period for either cartridge tested.

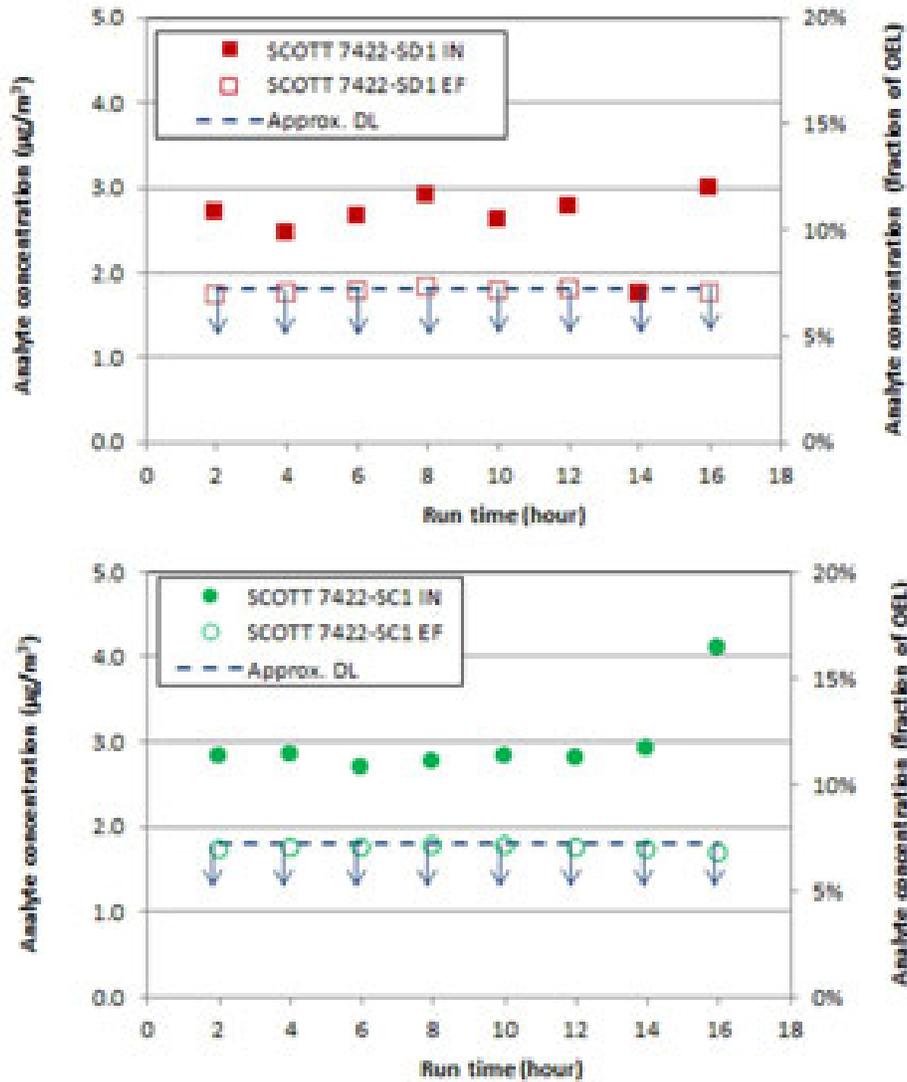


Figure 2. Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2,5-Dihydrofuran (see Figure 3) – The DL for 2,5-dihydrofuran corresponds to approximately 4.4% of the OEL. Inlet concentrations for the SCOTT 7422-SD1 cartridge ranged from less than the DL to approximately 10.7% of its OEL. All inlet concentrations for SCOTT 7422-SC1 cartridge were less than the DL. All outlet concentrations for both cartridges were below the DL, indicating no breakthrough for either cartridge.¹

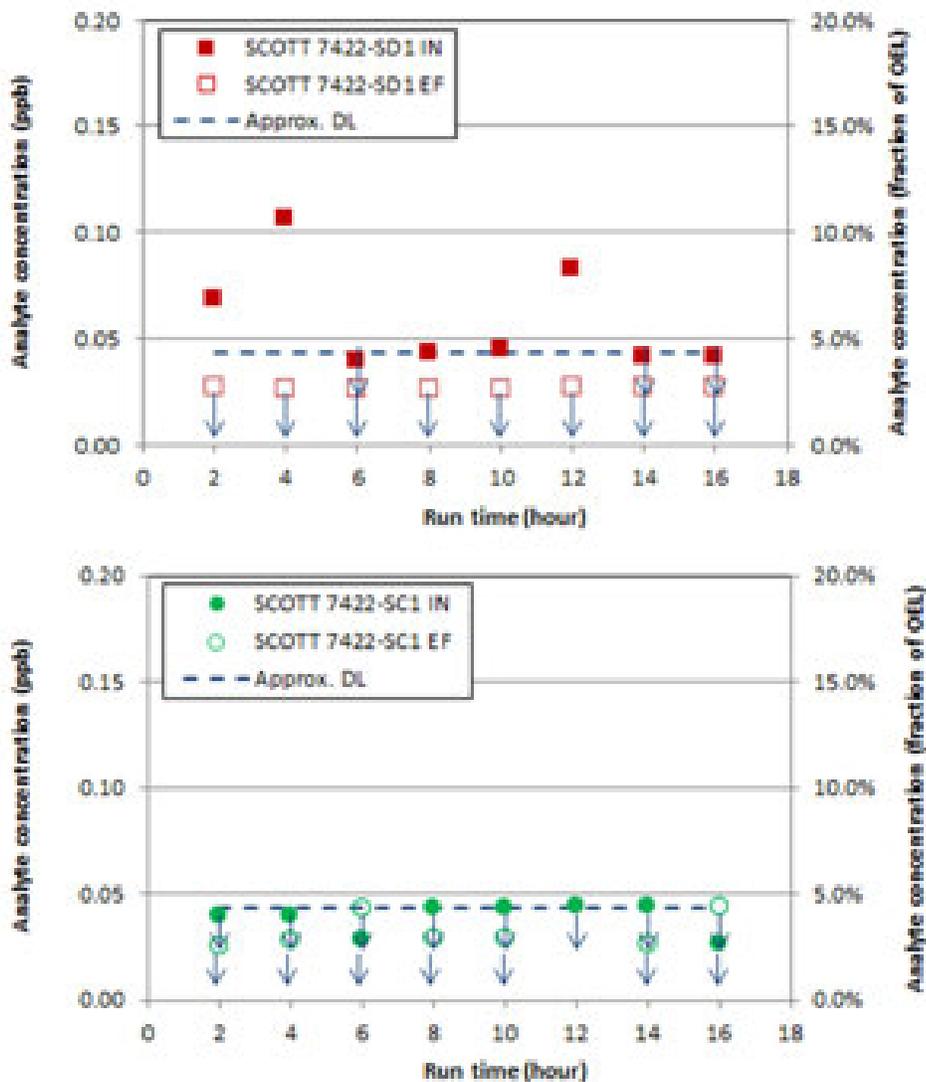


Figure 3. Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

¹ Outlet concentration results for furan and all substituted furans for the 12-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

N-Nitrosodimethylamine (see Figure 4) – The DL for NDMA corresponds to approximately 12.7% of the OEL. All inlet measurements for both cartridge tests were significantly greater than the DL, ranging between 486% and 4589% of the OEL. However, all of the outlet measurements were below the analytical DL for both respirator cartridges. Even though the DL is slightly greater than 10% of the OEL, there is no evidence of breakthrough over the measured time period for either cartridge tested.

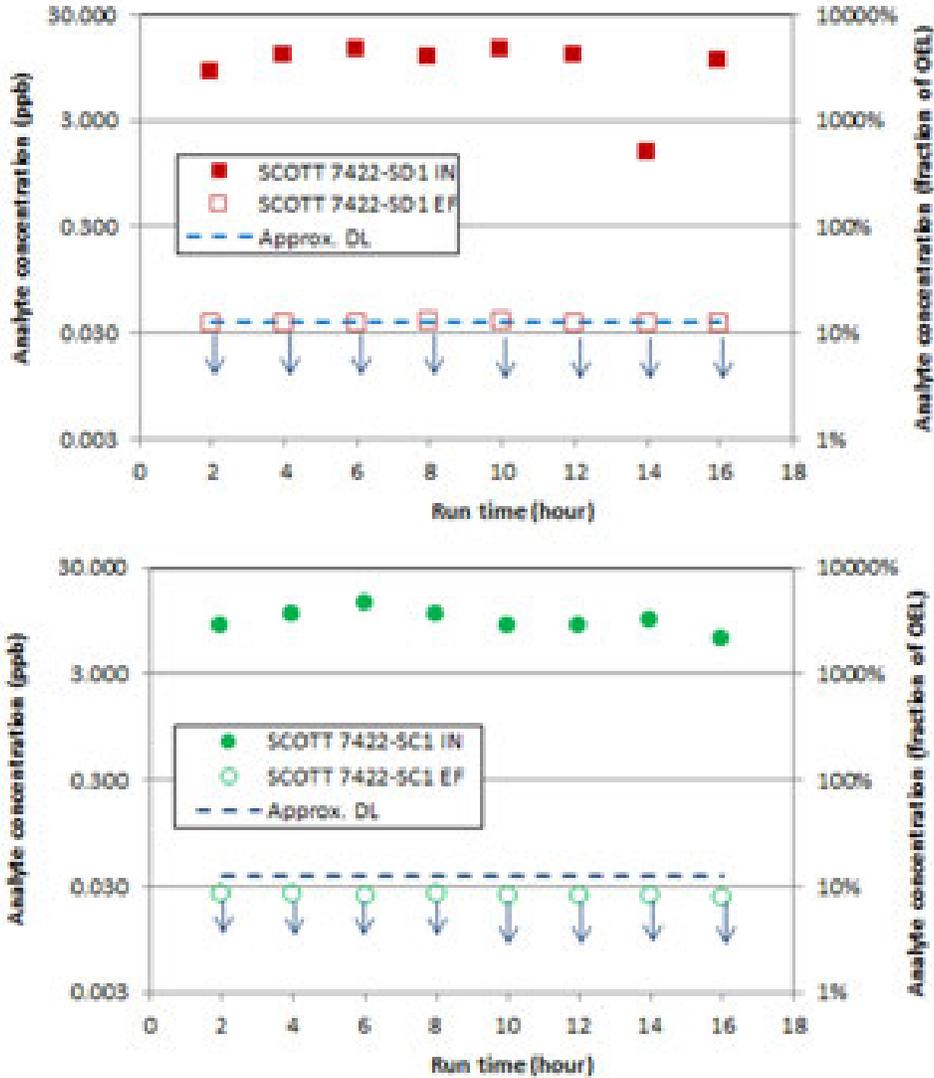


Figure 4. Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosodiethylamine (see Figure 5) – The DL for NDEA corresponds to approximately 25.7% of the OEL. The maximum inlet concentrations for both cartridges were observed in the first 6 hours of each test, and ranged from 42.9% to 70.8% of the OEL.¹ Inlet concentrations for the remainder of each test were all less than the DL. All of the respirator outlet measurements were below the DL. Even though the DL is greater than 10% of the OEL, there is no evidence of breakthrough over the measured time period for either cartridge tested.

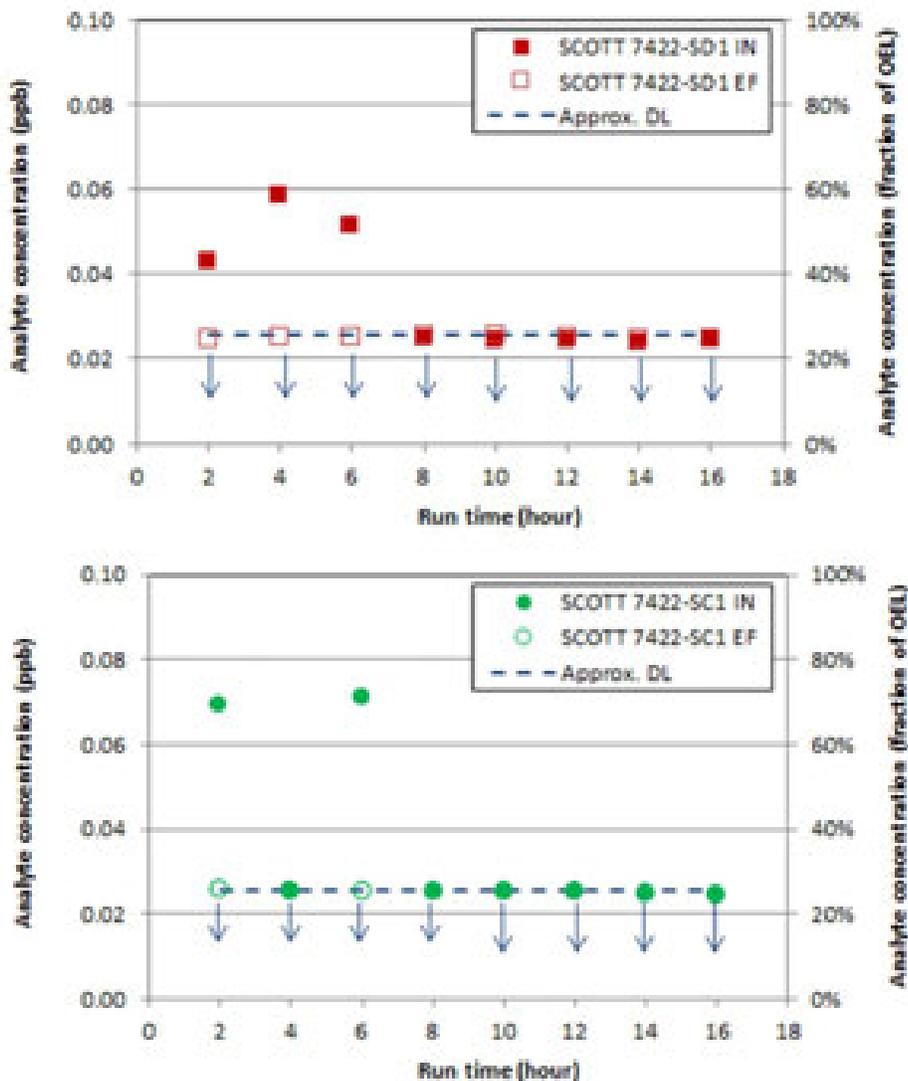


Figure 5. Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

¹ Although five inlet concentration measurements for NDEA are reported greater than the DL, analytical laboratory quality assurance flags indicate these analyte measurements are not confirmed. The analyte was detected on initial analysis, but not detected at or above the DL/RL on confirmation analysis.

N-Nitrosomethylethylamine (see Figure 6) – The DL for NMEA corresponds to approximately 9.9% of the OEL. All inlet measurements for both respirator cartridges were higher than the DL, with several measurements exceeding its corresponding OEL. All of the respirator outlet measurements were below the DL; therefore, there is no evidence of breakthrough over the measured time period for either cartridge tested.

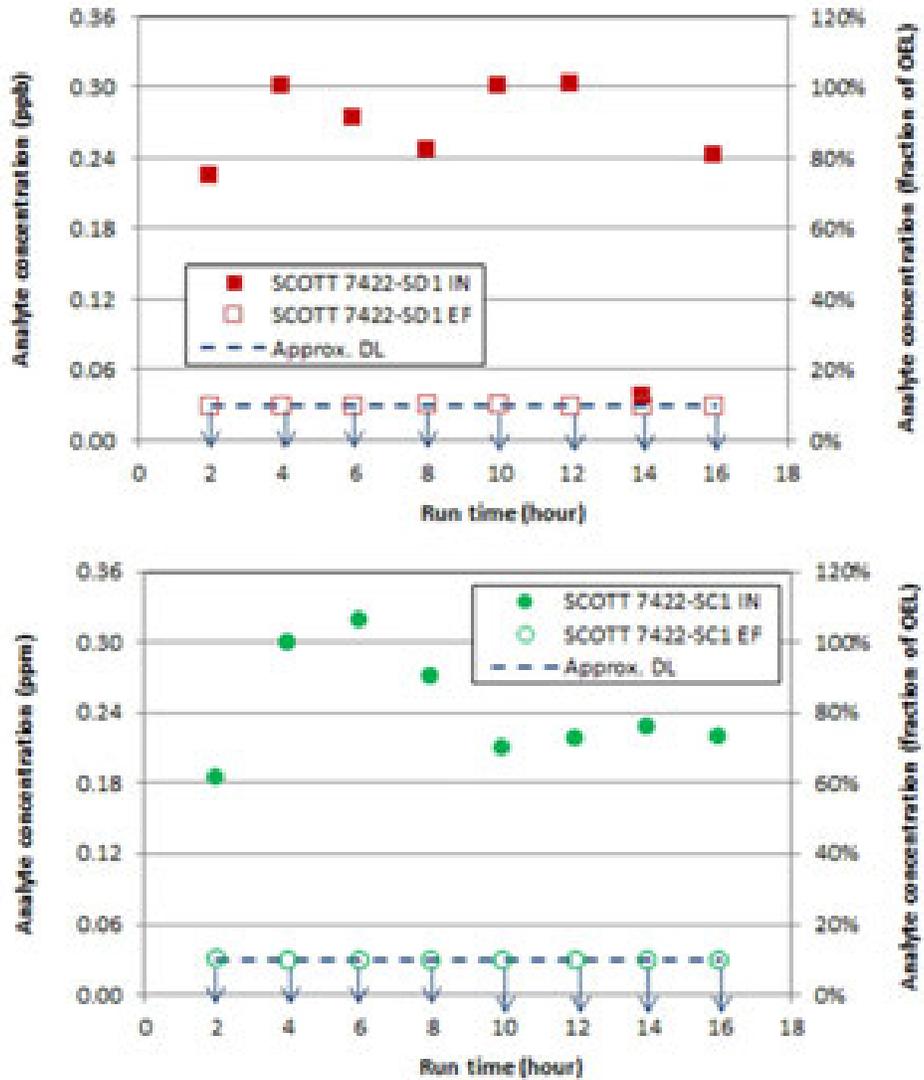


Figure 6. Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosomorpholine (see Figure 7) – The DL for N-Nitrosomorpholine corresponds to approximately 3.6% of the OEL. The respirator cartridge inlet concentrations for both cartridges started below 10% of the OEL at the beginning of each test, and increased to approximately 33% of the OEL before decreasing again later in the tests. All outlet concentrations were less than the analytical RL, indicating no breakthrough for either cartridge.

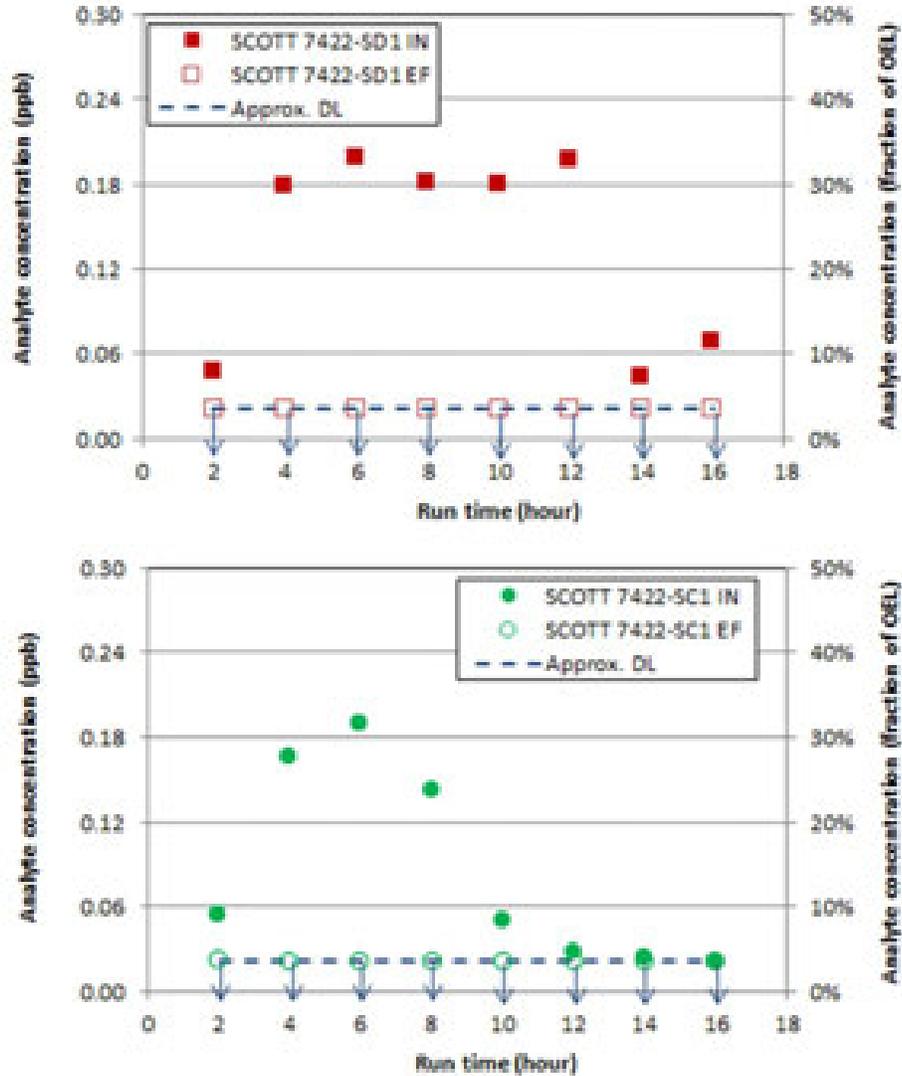


Figure 7. Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

6.0 Factoring in Historical Concentration Data

To fully assess respirator performance for COPC removal, historical data were reviewed to determine if the recent inlet measurements were representative of typical values. Historical AN Exhauster data from TWINS and the Site-Wide Industrial Hygiene Database were used for this assessment.

A complete table with historical and measured results for all 59 COPCs and their boiling point data is shown in Appendix F, along with a description of the historic source data that were used. Table 2 shows a subset of data for COPCs with boiling points below 70°C because a low boiling point can be a general indicator of poor adsorption on solid media.

In total, 10 COPCs have been previously measured in the AN Exhauster stack at concentrations above 10% of their respective OELs and above analytical RLs. These COPCs include ammonia, nitrous oxide, mercury, 1-butanol, formaldehyde, 2,3-dihydrofuran, ethylamine, NDMA, NMEA, and N-Nitrosomorpholine. Of these 10 COPCs, eight were detected in the cartridge study, but consistently at lower average and maximum concentrations than historic analyses. Specifically:

- Ammonia average and maximum inlet concentrations measured in this cartridge study were 45% and 76% lower than historic exhauster stack measurements.
- Mercury average and maximum inlet concentrations measured in this cartridge study were 94% and 99% lower, respectively, (i.e., approximately 18 and 110 times lower) than historic AN Exhauster measurements.
- The maximum concentration for formaldehyde from this cartridge testing measured 4% of the OEL, compared to maximum historic exhauster concentrations of 75% and average concentrations of 12%.
- Furan and 2,3-dihydrofuran reported average historic exhauster concentrations of 188% and 17% of the OEL, respectively. However, historic measurements for all other substituted furans were less than the RL. In contrast, the cartridge study measurements indicated less than DL concentrations for furan and 2,3-dihydrofuran. Three other furan compounds—2,5-dihydrofuran, 2-methylfuran, and 2-pentylfuran—were detected in the cartridge study inlet at average and maximum concentrations ranging from approximately 1% to 11% of their OELs, compared to historic measurements that were less than RLs.
- NDMA, NMEA, and N-Nitrosomorpholine average inlet concentrations measured in this study ranged from 34% to 58% lower than historic exhauster stack measurements. The maximum NDMA inlet concentration in this study (4589% of the OEL) was approximately 20 times lower than the historic maximum AN Exhauster measurement of nearly 86,000% of the OEL (257 ppb). For the nitrosamine family of compounds, only NDEA reported historic concentrations that were less than the RL, while average and maximum concentrations for NDEA from this study measured approximately 35 and 71% of the OEL, respectively. However, these inlet NDEA concentrations had analytical laboratory quality flags indicating the concentrations greater than the RL could not be confirmed.

Table 2. Historical AN Exhauster Data for COPCs with Boiling Points less than 70°C (158°F)

COPC Number and Name	CAS Number	Boiling Point (°F)	Occupational Exposure Limit (OEL)	Historical Measurements ¹					Measurements in this Study	
				# of Values	Max. Value	Average Value	Max. Value (% OEL)	Average Value (% OEL)	Max Inlet Value (% OEL)	Highest Value from Respirator Outlet (% OEL)
2 Nitrous Oxide	10024-97-2	-127	50 ppm	4	27.6	19.7	55%	39%	Not Measured	
1 Ammonia	7664-41-7	-28	25 ppm	37	134	46.4	536%	186%	130%	35%
50 2-Fluoropropene	1184-60-7	-11	0.1 ppm	4	<RL	<RL	<RL	<RL	Not Detected - TIC	
14 Formaldehyde	50-00-0	-6	0.3 ppm	46	0.224	0.0358	75%	12%	4.4%	0.74%
53 Methyl nitrite	624-91-9	10	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	
4 1,3-Butadiene	106-99-0	24	1 ppm	36	<RL	<RL	<RL	<RL	2.2% (RL) ²	2.1% (RL)
42 Ethylamine	75-04-7	62	5 ppm	27	0.611	0.0842	12%	1.7%	2.9%	0.096% (RL)
15 Acetaldehyde	75-07-0	69	25 ppm	20	0.191	0.105	0.76%	0.42%	0.060%	0.037%
19 Furan	110-00-9	88	1 ppb	50	<RL	1.88	<RL	188%	5.8% (DL)	5.8%(DL)
59 Methyl Isocyanate	624-83-9	103	0.02 ppm	1	<RL	<RL	<RL	<RL	Not Detected - TIC	
20 2,3-Dihydrofuran	1191-99-7	130	1 ppb	18	0.405	0.169*	41%	17%*	3.1% (DL)	3.1% (DL)
22 2-Methylfuran	534-22-5	147	1 ppb	49	<RL	<RL	<RL	<RL	1.3%	1.5%
8 Methanol	67-56-1	148	200 ppm	15	<RL	<RL	<RL	<RL	Not Measured	
21 2,5-Dihydrofuran	1708-29-8	152	1 ppb	50	<RL	<RL	<RL	<RL	10.7%	4.4% (DL)

¹ Historical data from TWINS industrial hygiene vapor database and SWIH database; see text for links and dates of queries. Values in italics include those data plus data from the TWINS headspace database, all samples earlier than May 2005.

* indicates that the value of the average would differ by a factor of 2 or more (in either direction) if non-reports were excluded.

"< RL" indicates that all pertinent measurements of the analyte were less than the reporting level

Plain font in the table indicates that only the recent databases (SWIHD headspace and TWINS Industrial Hygiene) were included.

Italics mean that the pre-2006 TWINS headspace data were also included.

"n/a" indicates no historical data was found in the databases

² "(DL)" indicates value represents approximate detection limit (DL), which is calculated using the reported detection limit (or reporting limit - RL, where noted) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.

7.0 Conclusions

Testing was conducted during the September 30–October 2, 2016, period using a slipstream from the AN tank farms exhauster under static conditions. The vapors were fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges SCOTT 7422-SD1 and SCOTT 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were each assessed with the tank farm exhauster vapors in tests conducted on separate days. Sorbent tubes were used to collect samples of the vapor stream entering and exiting the respirator cartridge, and were subsequently analyzed for COPC concentrations. PNNL was tasked to independently analyze the collected data, and make recommendations based on the results for respiratory cartridge performance and service life.

The AN Exhauster data are expected to provide conservatively high COPC concentrations compared to the ambient concentrations inside and outside the tank farm. Further, the flow rate through each respirator cartridge was maintained conservatively high compared to normal human breathing rates. The average temperatures of the sample slipstream during testing ranged from 66 to 107°F, and the average relative humidity ranged from 25 to 53%. The inlet concentrations measured are shown in Table 1. Thus, any conclusions on respirator cartridge performance pertain to the above-stated conditions.

Key conclusions from the assessment of the 59 COPCs in this study are described below:

- Based on measured cartridge inlet vapor concentrations from the AN Exhauster, three COPCs, ammonia, NDMA, and NMEA, exceeded their corresponding OEL.¹ Four COPCs—mercury, 2,5-dihydrofuran, NDEA, and N-Nitrosomorpholine—reported one or more inlet concentration measurements greater than 10% of their corresponding OEL, but less than 100%. Inlet and outlet measurements for all other COPCs did not exceed 10% of their respective OELs.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 130% of its OEL (32.5 ppm), which was significantly lower than the maximum historical measurement of 536% of its OEL from the AN Exhauster. For both cartridges, ammonia appeared to breakthrough, above 10% of its OEL after 10 hours. The inlet ammonia concentrations were relatively consistent at the beginning of the campaign for both cartridges. However, a significant decrease in ammonia inlet concentrations was observed at the 12- and 14-hour measurements for the SCOTT 7422-SD1 cartridge. The sudden decrease and increase in ammonia concentration is likely a result of analytical error or flow rate measurement error.
- Cartridge inlet concentration measurements for NDMA reached 4589% of its OEL (13.7 ppb), which was significantly lower than maximum and average historical measurements from the AN Exhauster; that is 85667% and 8033% of the OEL, respectively. However, all outlet concentrations were less than the analytical reporting limit of approximately 13% of the OEL, indicating no breakthrough for either cartridge.

¹ Occupational Exposure Limits accepted for Hanford Tank Farm use are based on OELs established by a U.S. governmental agency or national professional organization (e.g., OSHA, National Institute for Occupational Safety and Health, American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs using non-U.S. exposure limits, other established OELs for chemical surrogates when available, or other standard procedures. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Cartridge inlet concentrations for NMEA reached 106% of its OEL (0.32 ppb), which was lower than maximum and average historical measurements from the exhauster of 285% and 125%, respectively. However, all outlet concentrations were less than the analytical reporting limit of approximately 10% of the OEL, indicating no breakthrough for either cartridge.
- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant between 10% and 12% of its OEL, with two exceptions when the concentration decreased to less than the DL in one test, and increased to a maximum of 16% of the OEL in the other test. Overall, inlet concentrations of mercury during cartridge testing were substantially lower than average and maximum historic AN Exhauster measurements of approximately 200% and 1800% of the OEL, respectively. Mercury outlet concentrations during this study were all below the DL, indicating no breakthrough for the testing period.
- Maximum NDEA inlet concentrations for both cartridges were observed during the first 6 hours of each test, and ranged from 43% to 71% of the OEL. Inlet concentrations for the remainder of each test were less than the DL. All of the respirator outlet measurements were below the DL, indicating no breakthrough for either cartridge.
- N-Nitrosomorpholine inlet concentrations reached a maximum of approximately 33% of the OEL early in each test, before decreasing at later sample times. All outlet concentrations were less than the DL, indicating no breakthrough for either cartridge.
- The inlet concentration for 2,5-dihydrofuran reached a maximum of approximately 11% of its OEL in tests with the SCOTT 7422-SD1 cartridge. However, the majority of inlet measurements for both cartridges were at or near the analytical DL. All outlet concentrations for both cartridges were less than the DL, indicating no breakthrough for either cartridge.

8.0 Recommendations

- Based on the measurements taken for this study, ammonia breakthrough, above 10% of its OEL, occurred after 10 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). Inlet concentrations of ammonia remained relatively constant with an average of 118% of the OEL (29.5 ppm) up through the 10 hour sample period. This experimental result supports a 10-hour service life for the use of SCOTT 7422-SC1 and 7422-SD1 cartridges in APRs employed to protect workers at the Hanford AN tank farm, under the same conditions as those tested. Additional respirator cartridge and respirator selection evaluations by Industrial Hygiene professionals are recommended to determine proper respiratory protection requirements. Variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact the experiment-derived cartridge service life, especially if OEL thresholds are exceeded. Historic concentrations from the AN exhauster for a number of COPCs including ammonia, mercury, and NDMA were substantially higher than concentrations measured at the cartridge testing inlet, and should be carefully considered. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of APR applicability and an appropriate respirator cartridge change-out schedule for adequate worker protection.
- Additional recommendations related to NDMA and NDEA DLs, TICs, further data assessment, and future testing documented in PNNL-25860¹ for respirator cartridge testing on a slipstream from the Hanford AP tank exhauster are also relevant to the AN Exhauster. Future testing and multi-tank analysis of cartridge performance with a wider range of COPC concentrations and test conditions should help improve understanding of overall cartridge performance.

¹ Nune, SK, J Liu, CJ Freeman, and TM Brouns. 2016. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Pacific Northwest National Laboratory, Richland, Washington. (Unpublished)

9.0 References

1. OSHA 29 CFR 1910.134, https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=12716
2. OSHA Respirator Change Schedules - Decision Logic Flowcharts, <https://www.osha.gov/SLTC/etools/respiratory/decisionlogic/flowcharti.html>
3. OSHA Respirator Change Schedules Mathematical Modeling, and Factors that Influence Cartridge Service Life, https://www.osha.gov/SLTC/etools/respiratory/change_schedule.html
4. OSHA Standard Respirator Testing Procedures, <http://www.cdc.gov/niosh/npptl/stps/aprespcbrn.html>
5. Wood, GO. Estimating Service Lives of Organic Vapor Cartridges. *Am Ind Hyg Assoc J* 1994, 55, 11-15.
6. Wood, GO. Estimating Service Lives of Organic Vapor Cartridges II: A Single Vapor at All Humidities. *J Occup Environ Hyg* 2004, 1, 472-492.
7. Wood, GO, JL Snyder. Estimating Service Lives of Organic Vapor Cartridges III: Multiple Vapors at All Humidities. *J Occup Environ Hyg* 2007, 4, 363-374.
8. Janvier, F, L Tuduri, D Cossement, D Drolet, J Lara. Systematic Evaluation of the Adsorption of Organic Vapors onto a Miniaturized Cartridge Device using Breakthrough Tests in Parallel Experiment with a Full Size Respirator Cartridge. *Adsorpt Sci Technol* 2016, 34, 287-306.
9. Yoon, YH, JH Nelson, J Lara. Respirator Cartridge Service Life: Exposure to Mixtures. *Am Ind Hyg Assoc J* 1996, 57, 809-819.
10. 3M Service life software Version 3.3, <http://extra8.3m.com/SLSWeb/serviceLifeDisclaimer.html?regId=20&langCode=EN&countryName=United%20States>
11. Scotts Surelife Cartridge Calculator, <https://www.scottsurelife.com/DesktopUI/SelectRegion.aspx>
12. Respiratory Protection, Chapter 36 of the American Industrial Hygiene Association publication, *The Occupational Environment: Its Evaluation and Control and Management*, ISBN 1-931504-43-1
13. Industrial Hygiene Sampling and Analysis plan for Respirator Cartridge Testing, TFC-PLN-168, REV A, June 16, 2016
14. Air Purifying Respirator Cartridge Test Apparatus Special Tool and Equipment Evaluation, RPP-STE-59226, Rev 0, June 22, 2016.
15. Cohen, HJ, SP Levine, RP Garrison. Development of a Field Method for Calculating the Service Lives of Organic Vapor Cartridges - Part IV. Results of field validation trials, *American Industrial Hygiene Association Journal* (1991), pages 263-270.
16. Scott Air Purifying Respirators (742 Twin Cartridges), https://www.scottsafety.com/en/us/DocumentandMedia1/Poster_742SelectionGuide_HS_6411_0313.pdf
17. Meacham JE, JO Honeyman, TJ Anderson, ML Zabel, and JL Huckaby. 2006. *Industrial Hygiene Chemical Vapor Technical Basis*. RPP-22491, Rev. 1, CH2M Hill Hanford Group, Inc., Richland, Washington.
18. Industrial Hygiene Exposure Assessment Strategy, TFC-PLN-34, REV E-6, Feb 22, 2013.

Appendix A

Description of Respirator Cartridge Testing Setup

Appendix A

Description of Respirator Cartridge Testing Setup

The respirator cartridge testing system was developed by Washington River Protection Solutions and HiLine Engineering as a means to comprehensively test respirator cartridge performance with actual Hanford tank headspace gases. The system was designed to draw vapors from a tank or exhauster and flow the vapors through the respirator cartridge being tested.[13,14] The test equipment allows for sampling the vapor stream both before and after the cartridge, so that performance for a given COPC can be quantified. Sorbent media tubes were used to capture the COPCs and other hazardous contaminants. After a given test segment, the sorbent tubes were removed and analyzed. Sampling of the exhaust gas was performed every 2 hours, but this timing can be modified as necessary.

Figure A.1 provides a general schematic diagram for the respirator cartridge test apparatus, and Figure A.2 shows photographs of the actual equipment. The test system operates using vacuum to draw tank gases/vapors into the unit so that the potential for leakage to atmosphere is minimized until the gases/vapors are under positive pressure downstream of the vacuum pumps. By the time gases reach the vacuum pump, the COPCs are essentially captured/removed by either the sorbent tubes or the respirator cartridge.[13,14]

Flows through the respirator cartridge and through each sorbent tube are set and controlled/maintained using manual flow control valves on the outlet of each rotameter, and rotameters were calibrated against DryCal primary flow calibrators before and after testing. All equipment connections were leak tested prior to initiation of the test. Temperature, relative humidity, and pressure of the inlet gas/vapor stream are monitored by calibrated instrumentation.

Using Industrial Hygiene-approved materials, cartridge test equipment was constructed so that it would not influence/interfere with vapor analysis. Stainless steel or Teflon tubing and fittings were incorporated into the design where possible because of their relatively inert nature to the vapors being analyzed. Limited portions of the assembly used acrylic, Viton, glass, and Masterflex C-flex tubing, which are commonly used for various vapor-sampling applications.

Appendix B
Analytical Testing

Appendix B

Analytical Testing

The Sampling and Analysis Plan was developed under the direction and oversight of the Industrial Hygienist in conjunction with the Tank Farms Operations Contractor Retrieval and Closure, and Tank Farms Project and/or Production Operations Project Management Team.

Chemical compounds in the tank samples were analyzed using approved industrial hygiene methods or National Institute of Occupational Safety and Health-approved methods for quantifying hazardous airborne contaminants in the tank farm vapors. Methods including gas chromatography/mass spectrometry were used as the primary analytical techniques for identifying hazardous airborne contaminants (see Table B.1).

Table B.1. Information on Sorbent Media used to Capture Contaminants, Flow Rates Used, Analytical Methods to Extract Analyte from Sorbent Media, and Method Analysis to Quantify or Estimate the Concentrations of Hazardous Contaminant

Analyte	Media	Flow Rate (mL/min)	Analytical Method ^a	Instrument Used ^b	Analysis Location ^c
Acetonitrile	Charcoal Tube, SKC-226-09	100	NIOSH 1606	GC-FID	ALS
Acetonitrile	Carbotrap 300 TDU Tube	33	EPA TO-17 Modified	GC/MS	WRPS
Furans	TDU Tenax TA	33	EPA TO-17 Modified	GC/MS	WRPS
Semivolatile Organic Compounds	Carbotrap 150 TDU Tube	33	EPA TO-17 Modified	GC/MS	WRPS
Volatile Organic Compounds	Carbotrap 300 TDU tube	33	EPA TO-17 Modified	GC/MS	WRPS
Mercury	Anasorb C300, SKC-226-17-1A	250	NIOSH-6009	CVAA	WHL
Ammonia	Anasorb 747 (sulfuric acid), SKC-226-29	200	OSHA-ID-188	IC	WHL
1,3-butadiene	Charcoal, SKC-226-37, (Parts A and B)	200	NIOSH-1024	GC-FID	ALS
Aldehyde	DNPH Treated Silica Gel, SKC-226-119	200	EPA TO-11A	HPLC	ALS
Pyridine	Coconut Shell Charcoal, SKC-226-01offsite	1000	NIOSH-1613	GC-FID	ALS

Analyte	Media	Flow Rate (mL/min)	Analytical Method^a	Instrument Used^b	Analysis Location^c
Nitrosamines	Thermosorb/N	2000	NIOSH-2522 Modified	GC-TEA	CBAL
Ethylamine	XAD-7 (NBD) Chloride), SKC 226-96	200	OSHA-ID-34, 36, 40, and 41	HPLC-UV	ALS

^a Analytical Method

NIOSH: National Institute of Occupation Safety and Health

EPA: U.S. Environmental Protection Agency

OSHA: Occupational Safety and Health Administration

^b Instrument Used

GC-FID: Gas Chromatography-Flame Ionization Detector

GC/MS: Gas Chromatography-Mass Spectrometry

CVAA: Cold Vapor Atomic Absorption

IC: Ion Chromatography

HPLC: High Performance Liquid Chromatography

GC-TEA: Gas Chromatography-Thermal Energy Analyzer

HPLC-UV: High Performance Liquid Chromatography-Ultraviolet Detector

^c Analysis Location

ALS: ALS Environmental Salt Lake City

WRPS-222S: Washington River Protection Solutions, Organic Studies Group

WHL-222S: Wastren Hanford Laboratory

CBAL: Columbia Basin Analytical Laboratory, part of the RJ Lee Group

Appendix C

Raw Analytical Data

Appendix C

Raw Analytical Data

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Description

This appendix includes raw data of flow rate, temperature, pressure, and humidity, and analytical data for the AN Exhauster data set. Calculations using this data are given in Appendix D.

The raw analytical data is given only in this appendix. Washington River Protection Solutions (WRPS) converted these data into Excel data spreadsheets that were transmitted to Pacific Northwest National Laboratory. Comments on that conversion are provided below:

The analytical measurements listed in Results spreadsheet columns were transferred from entries labeled 'result' in the raw analytical .pdf files. The results were transferred into three rows in the spreadsheets. The first row contained the relevant information with the appropriate units. Where a results entry was given as 'ND' in the .pdf, a '<' symbol was used. Where a detection limit (DL)/reporting limit (RL) was listed as 'n/a,' the result entry in the spreadsheet was given as '0.0.'

The use of the RL or a DL varied among analytical laboratories. The term RL (equivalent to a limit of quantification) was used instead of a DL by ALS Environmental Salt Lake City, Columbia Basin Analytical Laboratory, and 222S–Wastren Hanford Laboratory (see Table F.1 in Appendix F for a complete correlation of which Chemicals of Potential Concern used an RL or a DL). The WRPS laboratory provided a DL, in contrast to an RL. Neither RLs nor DLs were provided for tentatively identified compounds (TICs).

Chain of custody information is provided clearly in the raw analytical data .pdf files, including analyte name, sample numbers, and laboratory-assigned numbers. Chemical Abstract Service numbers were not provided.

The nomenclature of the sample identification (ID) is the same for every set of chemicals. It is generally composed of a survey number, tank farm ID, test location, sample line, and tube bundle ID. Descriptions of these nomenclatures are given as follows:

'BLANK' means measurements obtained from sorbent tubes that have not had any vapor stream passed through them. 'BASE' means measurements obtained for ambient air (fresh air vs. tank vapor) running through the test system before initiation of tank vapor testing.

'8765' designations correspond to testing with the SCOTT 7422-SD1 respirator cartridge, whereas '8766' designations correspond to testing with the SCOTT 7422-SC1 respirator cartridge.

Position designations 'IN-A' and 'EFF-A' correspond to the respirator cartridge inlet and outlet measurements, respectively, at the 0- to 2-hour time intervals. Position designations 'B' through 'H' correspond to the subsequent 2-hour measurements for inlet (IN) and outlet (EFF): IN-B/EFF-B (2 to 4 hours), IN-C/ EFF-C (4 to 6 hours), IN-D/ EFF-D (6 to 8 hours), IN-E/ EFF-E (8 to 10 hours), IN-F/ EFF-F (10 to 12 hours), IN-G/ EFF-G (12 to 14 hours), and IN-H/ EFF-H (14 to 16 hours).

The sample IDs embed the information given above. For example, sample ID 16-08765-5-IN-A corresponds to the first cartridge survey (16-08765), sample line 5, and the first (0 to 2 hours) influent sample bundle (IN-A).

The flow rate passing through the respirator cartridge was approximately 30 L/min, while the sampling flow rates through the sorption tubes ranged between 30 and 200 mL/min for different chemicals that were being collected. WRPS provided these flow rates in files 'AN Farm Flow Rate 9-30-2016.xlsx' for the first survey with SCOTT 7422-SD1 and 'AN Farm Flow Rate 10-1-2016.xlsx' for the second survey

with SCOTT 7422-SC1. The information is shown in the tables below. Columns labeled Mach. Base 1 and Mach. Base 2 refer to the 'BASE' baseline samples for influent and effluent, respectively, to verify machine cleanliness prior to experimental measurements.

WRPS provided the temperature and humidity information in files 'AN Farm DRI 9-30-2016.xls' and 'AN Farm DRI 10-1-2016.xls.' The information is shown in the tables provided in this appendix. Several terms used in the DRI files are described below.

- 'Pre' and 'Post' indicate the general time signature when the direct read instrument measurements were taken. 'Pre' refers to the beginning of the 2-hour sample duration, and 'Post' refers to the end of the 2-hour sample duration.
- 'Influent' and 'Effluent' indicate the location of the measurement within the test system. 'Influent' measurements are taken at the inlet of the system upstream of the respirator cartridge. 'Effluent' measurements are taken downstream of the respirator cartridge. The pressure, temperature, and humidity effluent sensors are located at the end of the test system near the vacuum pump, whereas the DRI measurements for ammonia and VOCs are from a sampling location between the respirator cartridge and the effluent sorbent tube samples.
- The DRI measurements for ammonia and VOCs could not be taken while the test system sample pumps were operational. 'After Sample Taken' refers to the time signature for these direct read results (e.g., Sample A DRI measurements were taken immediately after the Sample A sorbent tubes were taken and replaced with Sample B sorbent tubes).

The raw analytical data for chemicals in each category are summarized together. Examples of chemicals in each category follow:

- SVOC (or SVOA): Biphenyl, Diethylphthalate, Tributyl phosphate, Dibutyl butylphosphonate, Dodecane, Hexadecane
- SVOCTIC (or SVOATIC): Undecane, Cyclotetrasiloxane, octamethyl, Decamethylcyclopentasiloxane, Dodecane,4,6-dimethyl
- VOC (or VOA): Acetone, Acetonitrile, Acetophenone, Benzene, Butanal,1-Butanol, Butanenitrile, 3-Buten-2-one, Cyclohexane, Decane, Ethanol, Ethylbenzene, Furan, Hexane, Hexanone, Methylene Chloride, Propanenitrile, Styrene, Tetrachloroethene, Toluene, Trichlorofluoromethane
- VOCTIC (or VOATIC): 2,6-Dimethyldecane, Decane, 2,3,5,8-tetramethyl-, Decane, 3,7-dimethyl-, Methenamine, Undecane, 2,6-dimethyl-
- Furans: 2,3-Dihydrofuran, 2-Pentylfuran, Furan, Tetrafulan
- Ethylamine (amines): Dimethylamine, Ethylamine, Methylamine
- Acetonitrile: Acetonitrile
- Mercury: Mercury
- Ammonia: Ammonia
- Aldehyde: Acetaldehyde, Acetone, Butyraldehyde, Formaldehyde, Hexanal, Propionaldehyde, Valeraldehyde
- 1,3 Butadiene: 1,3-Butadiene
- Pyridines: 2,4-Dimethylpyridine, Pyridine
- Nitrosamines: N-Nitrosodimethylamine

SCOTT 7422-501 Cartridge (9/30/16) AN Exhauster

Volumes Air Collected (L)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	3.85	4.13	3.83	4.10	3.93	4.15	4.20	4.12	4.07	4.10	4.12	4.01	4.11	4.16	3.85	4.06	3.77	4.05
VOC	B	4.12	3.98	4.11	3.82	4.11	3.75	4.25	3.55	3.84	3.88	3.77	4.01	3.88	3.99	3.84	3.71	3.77	3.81
Furans	C	3.98	6.04	4.00	6.11	4.14	6.40	4.20	6.46	4.04	6.38	3.95	6.27	3.93	6.10	3.93	6.08	3.87	5.85
Ethylamine	D	12.1	12.4	12.2	12.1	12.2	12.4	12.4	12.4	12.1	12.2	11.9	12.0	11.8	11.9	12.1	12.0	11.7	11.8
Acetonitrile	E	11.8	12.1	12.1	12.4	12.5	12.7	12.4	12.2	12.2	12.0	11.9	11.5	11.8	11.1	11.8	12.4	13.8	11.7
Mercury	F	29.4	30.1	30.0	30.4	30.6	30.6	29.6	30.3	29.4	29.7	29.3	29.9	29.5	29.4	29.3	29.6	29.7	29.5
Ammonia	G	24.4	23.8	24.2	25.1	24.4	23.9	24.5	23.8	24.2	23.8	24.1	22.8	24.2	23.7	24.1	24.4	23.9	23.7
Aldehyde	H	24.4	23.7	24.2	24.4	24.2	24.0	24.5	24.0	24.2	23.6	23.6	23.3	23.7	23.5	23.7	23.5	23.7	23.7
1,3-Butadiene	I	23.7	23.8	24.2	24.2	24.5	24.0	23.4	23.8	22.5	22.9	22.2	22.9	22.8	23.1	23.6	23.2	23.7	24.1
Pyridine	J	119	121	118	118	118	119	118	121	116	119	116	119	116	119	117	119	115	118
Nitrosamines	K	244	236	243	238	247	239	248	240	243	236	242	234	242	235	241	236	238	232

Flow Rates (ml/min)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	32.2	34.4	31.9	34.2	32.8	34.6	32.0	34.3	33.9	34.2	34.4	33.3	34.4	34.7	32.1	4.6	31.4	33.5
VOC	B	34.3	33.2	36.0	31.8	34.4	31.3	33.4	29.6	32.0	30.7	31.4	33.4	32.3	29.9	32.0	30.9	31.4	31.8
Furans	C	33.2	50.3	33.3	51.0	34.5	53.3	35.0	53.9	33.6	53.2	32.9	52.2	32.7	50.8	32.8	50.8	32.3	48.8
Ethylamine	D	101	103	102	101	102	103	103	101	102	98.8	100	98.5	99.4	101	100	97.9	98.4	
Acetonitrile	E	98.4	101	101	103	104	106	103	101	101	100	99.5	99.7	98.7	92.9	98.3	103	98.6	97.9
Mercury	F	245	250	250	254	253	253	247	251	245	247	244	249	246	245	244	247	247	246
Ammonia	G	203	199	201	209	203	200	204	198	202	199	201	190	201	197	201	203	200	198
Aldehyde	H	203	198	202	204	202	200	204	200	202	197	198	194	198	196	197	196	198	197
1,3-Butadiene	I	198	198	202	202	204	200	195	198	188	190	185	191	190	193	197	193	197	201
Pyridine	J	995	1005	983	987	980	993	980	1005	970	984	983	990	970	990	975	993	953	980
Nitrosamines	K	2035	1970	2026	1985	2060	1995	2063	2000	2025	1970	2063	1950	2063	1960	2060	1970	1985	1935

Data points highlighted in yellow were identified by the test operator as being low/ suspect due to media tube issues.

SCOTT 7422-9C1 Cartridge (10/1/16) AN Exhauster

Volumes Air Collected (L)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	3.95	3.85	3.85	3.78	3.85	3.80	3.80	4.03	3.82	3.82	3.84	3.96	4.13	3.36	4.14	4.05	4.24	
VOC	B	4.10	3.80	4.45	3.74	4.11	3.93	3.67	3.88	3.81	4.13	3.64	3.82	3.67	3.60	3.54	3.57	3.73	4.25
Furans	C	4.19	6.22	4.17	6.41	4.11	5.83	5.83	3.85	3.77	5.75	3.73	5.58	3.67	6.00	3.64	6.02	5.91	3.62
Ethylamine	D	12.1	12.3	12.8	12.6	12.3	12.3	12.0	11.9	11.8	12.0	11.4	11.7	12.3	12.1	12.0	11.6	12.6	12.0
Acetonitrile	E	12.4	12.7	12.7	12.4	12.0	12.4	12.4	12.1	12.1	12.2	11.6	11.6	11.6	12.4	11.5	12.3	12.3	11.5
Mercury	F	30.0	30.2	29.9	30.7	30.3	30.4	30.3	29.5	29.9	29.0	29.3	29.6	29.6	29.7	29.7	21.3	30.3	
Ammonia	G	23.9	24.6	24.0	24.7	24.2	24.5	24.3	24.2	24.1	23.8	23.6	23.6	23.7	23.4	23.7	27.2	24.5	
Aldehyde	H	24.1	23.6	24.5	24.8	23.8	23.8	23.7	23.9	23.7	23.4	23.1	23.3	22.8	23.9	23.8	23.8	24.1	23.8
1,3-Butadiene	I	23.7	24.2	23.7	24.4	23.7	24.2	23.3	23.7	23.6	23.2	23.4	22.9	23.3	24.2	24.0	24.0	24.1	24.2
Pyridine	J	117	118	119	121	119	122	121	120	119	123	118	122	119	122	118	123	123	119
Nitrosamines	K	244	240	243	239	243	242	243	242	241	241	239	239	239	240	238	238	242	

Flow Rates (ml/min)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	33.0	32.1	32.1	31.5	32.1	31.7	31.7	33.6	31.8	32.3	32.0	33.0	34.4	11.3	34.5	33.2	35.0	
VOC	B	34.2	31.8	37.1	31.2	34.3	32.7	30.6	32.4	31.8	34.3	30.3	31.8	30.6	30.0	29.5	29.8	30.8	35.1
Furans	C	34.9	51.9	34.8	53.4	34.3	48.6	48.6	32.1	31.5	47.9	31.1	46.5	30.6	50.0	30.3	50.2	48.9	29.9
Ethylamine	D	103	102	107	105	102	102	100	98.9	98.9	100	96.3	97.5	102	101	100	96.4	104	98.8
Acetonitrile	E	103	106	106	104	99.8	103	104	101	101	102	97.0	96.5	96.4	103	98.5	102	100	98.1
Mercury	F	250	251	249	254	253	253	252	254	246	249	242	244	246	248	248	247	176	251
Ammonia	G	199	205	200	206	202	204	202	201	201	201	198	196	197	198	195	198	224	202
Aldehyde	H	201	197	204	206	199	199	198	199	198	195	193	194	190	199	198	198	199	197
1,3-Butadiene	I	197	202	197	203	196	202	194	197	197	193	195	191	195	202	200	200	199	200
Pyridine	J	977	987	988	1005	993	1013	1010	999	990	1025	985	1013	990	1000	985	1005	1015	985
Nitrosamines	K	2080	2008	2010	1990	2010	2015	2010	2020	2020	2005	2010	1990	1995	1990	2000	1985	1970	2000

SCOTT 7422-SD1 Cartridge (9/30/16) AN Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	66.2	72.1	80.5	65.2	60.9	72.3	70.9	77.5	83.3
Temperature	F	58.9	65.4	72.8	77.1	78.9	72.1	70.4	68.2	65.1
Pressure	Torr	734	734	722	721	720	722	721	730	741
NH3	ppm									
VOC	ppm									

Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	59.0	80.0	65.8	59.0	71.9	65.7	73.4	84.0	83.0
Temperature	F	65.6	72.4	76.2	79.0	72.1	71.5	69.8	65.2	58.9
Pressure	Torr	734	722	722	720	720	722	722	730	722
NH3	ppm		36	30	30	32	25	33	28	1.0
VOC	ppm		1.1	1.0	1.5	1.0	1.0	1.0	0.89	0.68

Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	31.4	31.3	37.5	32.7	39.1	31.4	31.1	30.1	57.7
Temperature	F	59.6	64.9	72.8	77.8	79.9	76.2	71.5	69.0	65.7
Pressure	Torr	424.1	424	433	431	433	445	440	442	741
NH3	ppm									
VOC	ppm									

Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	31.2	37.8	31.2	28.1	31.8	30.5	33.7	32.6	38.1
Temperature	F	64.7	73.0	79.3	81.8	76.8	72.3	70.4	66.0	60.0
Pressure	Torr	435	441	445	448	445	444	445	445	443
NH3	ppm		0.00	1.0	0.00	0.00	1.0	2.0	2.0	0.00
VOC	ppm		0.70	0.80	1.1	0.64	1.07	0.10	0.42	0.35

SCOTT 7422-SC1 Cartridge (10/1/16) AN Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	72.8	74.8	79.3	68.9	71.0	68.5	68.9	72.7	70.3
Temperature	F	58.2	67.4	71.3	72.6	71.2	66.3	62.6	59.0	56.6
Pressure	Torr	734	726	725	726	726	727	727	728	726
NH3	ppm									
VOC	ppm									

Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	60.9	80.3	69.7	70.5	70.6	70.3	73.7	71.9	79.9
Temperature	F	67.4	71.4	73.1	71.6	66.6	61.8	58.7	55.8	55.0
Pressure	Torr	734	726	726	726	726	728	727	727	742
NH3	ppm		33.0	38.0	42.0	34.0	32.0	33.0	34.0	35.0
VOC	ppm		3.60	1.30	2.10	1.24	1.39	1.41	1.38	1.48

Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	28.4	24.9	36.8	35.0	34.3	31.5	35.5	35.7	34.6
Temperature	F	58.5	65.7	69.9	71.1	70.2	67.3	62.6	59.3	57.9
Pressure	Torr	430	431	439	433	432	440	430	429	425
NH3	ppm									
VOC	ppm									

Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	25.3	38.0	36.0	34.8	32.6	34.8	37.0	36.2	61.4
Temperature	F	65.8	70.1	71.3	70.4	68.5	62.5	59.2	57.4	56.9
Pressure	Torr	445	446	448	448	448	446	443	443	740
NH3	ppm		0.00	0.00	0.00	8.0	0.00	0.00	0.00	4.0
VOC	ppm		0.90	1.0	1.1	1.6	0.00	0.58	0.41	0.32

Data points highlighted in yellow were identified by the test operator as being suspect.

Spencer
 12/1/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162009

SDG Number:

Customer Sample ID: 16-08765-1-BASE-EFF

Customer Sample ID: 16-08765-1-BASE-EFF

Sample #	W	M	CAS #	Analyte	Unit	STD %	Blank	Residual	Repeatability	Average	RPD %	Spk Res %	Det Limit	Conc Err %	Qual Flags
VAPOR:TDU SDC8 E2															
5187200543			3891-88-3	2,3,15-Trimethyldecane	ng/g	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187200543			95-48-7	2-Methylphenol	ng/g	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
5187200543			108-28-48d	Cresol (m & p)	ng/g	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187200543			93-53-4	Biphenyl	ng/g	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
5187200543			79-48-8	Dibutyl butylphosphonate	ng/g	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187200543			84-65-2	Dioctylphthalate	ng/g	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
5187200543			112-80-3	Dodecane	ng/g	92	<2.89	11	n/a	n/a	n/a	n/a	2.89	n/a	n/a
5187200543			544-78-3	Heptadecane	ng/g	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5187200543			828-59-4	Tetradecane	ng/g	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
5187200543			128-73-8	Triethyl phosphate	ng/g	100	<9.8	<9.8	n/a	n/a	n/a	n/a	9.8	n/a	n/a
5187200543			828-58-5	Tridecane	ng/g	89	+1.8	7.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187200543			828-78-7	Heptadecane	ng/g	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5187200543			828-82-8	Peradecane	ng/g	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

NA = Not Analyzed, ND = Not Detected

U = Less Than Detection Limit

J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162009
 SDG Number:
 Customer Sample ID: 16-08765-1-0BASE-IN
 Customer Sample ID: 16-08765-1-0BASE-IN

Sample #	AI	Cell #	Analysis	Unit	STD %	Blank	Revol	Duplicates	Average	RPO %	Spk Res %	Det Limit	Car Bin %	Qual Flag
VAPOR: TOC S/CDA #2														
018200044		3891-86-3	2,8,16-Trinitrofluorene	NG25	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
018200044		95-48-7	2-Methylphenol	NG25	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
018200044		100-39-4M	Cresol (m & p)	NG25	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
018200044		92-82-4	Biphenyl	NG25	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
018200044		78-48-8	Dibutyl butylphosphonate	NG25	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
018200044		84-69-2	Dibutylphthalate	NG25	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
018200044		112-40-3	Dodecane	NG25	92	<2.92	6.2	n/a	n/a	n/a	n/a	2.92	n/a	J
018200044		344-78-3	Hexadecane	NG25	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
018200044		329-59-4	Tetradecane	NG25	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
018200044		126-73-8	Tributyl phosphite	NG25	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	U
018200044		828-55-5	Tridecane	NG25	89	<1.8	4.2	n/a	n/a	n/a	n/a	1.8	n/a	J
018200044		329-78-7	Heptadecane	NG25	129	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
018200044		329-82-9	Peradecane	NG25	94	<3.5	<3.5	n/a	n/a	n/a	n/a	3.5	n/a	U

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J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 30163049
 SOG Number:
 Customer Sample ID: 16-08765-1-BLANK1
 Customer Sample ID: 16-08765-1-BLANK1

Sample #	SI	AM	CAS #	AcqFile	Unit	RTS %	RTS	Resolv	Depth	Average	SPFO %	SpR Rec %	Peel Limit	Col Eff %	Qual Flag
VAPOR:TDU SYDA #2															
5181030545			2691-06-3	3,4,10-Trimethyldecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5181030545			35-48-7	2-Methylphenol	MG5	99	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
5181030545			108-29-4M	Cresol (m & p)	MG5	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a,U
5181030545			92-52-4	Biphenyl	MG5	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
5181030545			78-48-6	Dibutyl diphosphonate	MG5	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a,U
5181030545			84-66-2	Diphenylsulfide	MG5	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
5181030545			112-40-3	Dodecane	MG5	90	<0.60	0.70	n/a	n/a	n/a	n/a	0.55		n/a,U
5181030545			344-76-3	Hexadecane	MG5	95	<3.9	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
5181030545			629-59-4	Tetradecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5181030545			129-73-8	Trisbutyl phosphite	MG5	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a,U
5181030545			829-33-5	Tridecane	MG5	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
5181030545			829-78-7	Heptadecane	MG5	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5181030545			829-82-9	Pentadecane	MG5	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U

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J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603069
 SDC Number:
 Customer Sample ID: 16-08765-1-BLANK2
 Customer Sample ID: 16-08765-1-BLANK2

Sample #	IC	Alt	CAS #	Acquire	Unit	RTD %	Blank	Result	Duplicate	Average	SPD %	SPR Rec %	Per Limit	Car Bin %	Qual Flags
VAPOR:TDU SPC8 IE2															
5161000546			3091-86-3	2,6,10-Trimethyldecane	MG8	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5161000546			95-48-7	2-Methylphenol	MG8	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
5161000546			106-39-4M	Cresol (m & p)	MG8	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5161000546			32-52-4	Biphenyl	MG8	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
5161000546			78-49-6	Diallyl butylphosphonate	MG8	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5161000546			84-66-2	Dicyclopentadiene	MG8	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
5161000546			112-80-3	Dodecane	MG8	90	<0.80	1.4	n/a	n/a	n/a	n/a	0.80	n/a	n/a
5161000546			544-78-3	Hexadecane	MG8	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5161000546			629-59-4	Tetradecane	MG8	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5161000546			126-73-8	Triethyl phosphite	MG8	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
5161000546			329-30-5	Tetralene	MG8	89	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161000546			629-78-7	Heptadecane	MG8	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5161000546			629-82-9	Pentadecane	MG8	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603049
 SOG Number:
 Customer Sample ID: 16-08765-1-04-B
 Customer Sample ID: 16-08765-1-04-B

Sample #	E	AI	CAI #	Sample	Unit	RTD %	Blank	Result	Duplicate	Average	BP0 %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR:TDU SVCA #2															
5161005547			2081-00-3	2,3,5-Trimethylbutane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5161005547			30-45-7	3-Methylphenol	MG5	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
5161005547			108-39-4M	Cresol (m & p)	MG5	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5161005547			30-52-4	Biphenyl	MG5	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
5161005547			78-48-8	Diethyl butylphosphonate	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5161005547			34-65-2	Diethylthiathole	MG5	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
5161005547			112-40-3	Dodecane	MG5	82	<0.80	32	n/a	n/a	n/a	n/a	0.55		n/a
5161005547			544-76-3	Hexadecane	MG5	86	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
5161005547			209-39-4	Tetradecane	MG5	100	<3.9	8.4	n/a	n/a	n/a	n/a	3.9		n/a,U
5161005547			126-73-8	Triethyl phosphate	MG5	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5161005547			209-30-5	Tridecane	MG5	86	<1.8	13	n/a	n/a	n/a	n/a	1.8		n/a
5161005547			209-76-7	Heptadecane	MG5	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5161005547			209-60-8	Pentadecane	MG5	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 30163049
 SDC Number:
 Customer Sample ID: 16-08765-1-IN-C
 Customer Sample ID: 16-08765-1-IN-C

Sample #	AI	CAS #	Analyte	Unit	RTS %	Mass	Resol	Duplicates	Average	SPP %	Spk Res %	Det Limit	Det Err %	Qual Flags
1617000048		2091-06-3	2,4,6-Trimethyltoluene	MGs	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.0	n/a	n/a
1617000048		95-48-7	2-Methylphenol	MGs	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
1617000048		106-39-4M	Cresol (m & p)	MGs	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.0	n/a	n/a
1617000048		30-52-4	Biphenyl	MGs	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
1617000048		78-69-6	Dibutyl butylphosphonate	MGs	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
1617000048		84-85-2	Dimethylsiloxane	MGs	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
1617000048		112-40-3	Dodecane	MGs	92	<0.00	0.3	n/a	n/a	n/a	n/a	0.00	n/a	n/a
1617000048		544-76-3	Hexadecane	MGs	89	<1.3	<1.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
1617000048		5078-09-4	Tetradecane	MGs	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
1617000048		126-73-8	Triethyl phosphate	MGs	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.0	n/a	n/a
1617000048		5078-00-5	Tridodecane	MGs	89	<1.8	3.0	n/a	n/a	n/a	n/a	1.0	n/a	n/a
1617000048		5078-76-7	Heptadecane	MGs	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
1617000048		5078-00-8	Peradecane	MGs	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163069
 SDC Number:
 Customer Sample ID: 16-08765-1-IN-D
 Customer Sample ID: 16-08765-1-IN-D

Sample #	Alt	CAS #	Sample	Unit	RTS %	Mass	Resist	Duplicate	Average	RPD %	Std Dev %	Std Limit	Car Exp %	Qual Flags
VAPOR:TDI SYDA #2														
5167000549		2691-86-3	2,6,10-Trimethyldecane	MG25	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a/U
5167000549		35-48-7	2-Methylhexanol	MG25	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a/U
5167000549		108-29-4M	Creosol (m & p)	MG25	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a/U
5167000549		50-52-4	Biphenyl	MG25	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a/U
5167000549		78-48-6	Diethyl sulphophosphate	MG25	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a/U
5167000549		84-85-2	Dimethylsulfolane	MG25	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a/U
5167000549		112-80-3	Dodecane	MG25	92	<5.65	38	n/a	n/a	n/a	n/a	5.65	n/a	n/a
5167000549		544-76-3	Hexadecane	MG25	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a/U
5167000549		528-28-4	Tetradecane	MG25	100	<3.9	5.7	n/a	n/a	n/a	n/a	3.9	n/a	n/a/U
5167000549		126-73-8	Trimethyl phosphate	MG25	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a/U
5167000549		528-50-5	Tridecane	MG25	89	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167000549		528-76-7	Heptadecane	MG25	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a/U
5167000549		528-52-8	Peradecane	MG25	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a/U

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d = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603099
 SDS Number:
 Customer Sample ID: 16-00765-1-IN-E
 Customer Sample ID: 16-00765-1-IN-E

Sample #	W	AF	SAS #	Sample	Unit	RTD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Std Limit	Out Lin %	Qual Flags
VAPOR: TOL / NVCA #2															
5187000000			3007-06-3	2,6,10-Trimethyldecane	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187000000			30-49-7	2-Methylphenol	NGS	89	44.8	44.8	n/a	n/a	n/a	n/a	4.0	n/a	n/a
5187000000			100-39-4M	Cresol (m & p)	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	5.0	n/a	n/a
5187000000			30-52-4	Biphenyl	NGS	100	44.0	44.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
5187000000			78-49-8	Dibutyl sulphophosphate	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187000000			84-66-2	Diethyltriazole	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
5187000000			112-40-3	Endosulfan	NGS	92	48.00	17	n/a	n/a	n/a	n/a	0.50	n/a	n/a
5187000000			544-76-3	Hexadecane	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5187000000			509-99-4	Tetradecane	NGS	100	<3.8	10	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5187000000			126-73-8	Trisbutyl phosphate	NGS	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.0	n/a	n/a
5187000000			529-30-3	Tridecane	NGS	89	41.8	10	n/a	n/a	n/a	n/a	1.0	n/a	n/a
5187000000			529-76-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5187000000			529-82-9	Hexadecane	NGS	94	<3.0	4.3	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603049
 SOG Number:
 Customer Sample ID: 16-08765-1-IN-F
 Customer Sample ID: 16-08765-1-IN-F

Sample #	E	AF	CAS #	Sample	Unit	RTD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Out Br %	Qual Flags
VAPOR:TDU:SVQA:RZ															
5167000001			3091-30-3	2,6,10-Trimethyldecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			30-46-7	2-Methylphenol	MG5	89	<4.9	<4.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			108-29-4M	Cresol (m & p)	MG5	100	<5.8	<5.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			50-52-4	Biphenyl	MG5	110	<4.0	<4.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			78-48-6	Diethyl sulphophosphate	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			34-66-2	Diethylthiuram	MG5	100	<7.0	<7.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5167000001			112-40-3	Dodecane	MG5	80	<0.80	4.1	n/a	n/a	n/a	n/a	0.50	n/a	n/a
5167000001			344-76-3	Hexadecane	MG5	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5167000001			309-39-4	Tetradecane	MG5	100	<3.9	4.3	n/a	n/a	n/a	n/a	3.9	n/a	n/a
5167000001			126-73-8	Tributyl phosphate	MG5	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
5167000001			309-30-5	Tridecane	MG5	89	<1.8	1.1	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167000001			309-78-7	Heptadecane	MG5	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5167000001			309-60-8	Pentadecane	MG5	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

MA = Not Analyzed, MD = Not Detected

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J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 30163069
 SDG Number:
 Customer Sample ID: 16-08765-1-IN-G
 Customer Sample ID: 16-08765-1-IN-G

Sample #	AI	CAS #	Acryle	Unit	BTS %	Eluent	Result	Depth	Average	SPG %	SPG Res %	Det Limit	Col Eff %	Qual Flag
1617000552	1617000552	2091-86-3	2,4,6-Trimethyldecane	MG	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
1617000552	1617000552	95-48-7	2-Methylpental	MG	99	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
1617000552	1617000552	106-29-4M	Cresol (m & p)	MG	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
1617000552	1617000552	92-52-4	Biphenyl	MG	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
1617000552	1617000552	78-48-6	Dibutyl sulphophosphate	MG	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
1617000552	1617000552	84-85-2	Dithylnitrate	MG	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
1617000552	1617000552	112-40-3	Dodecane	MG	99	<0.80	21	n/a	n/a	n/a	n/a	0.55	n/a	n/a
1617000552	1617000552	544-76-3	Hexadecane	MG	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
1617000552	1617000552	829-29-4	Tetradecane	MG	100	<3.9	3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
1617000552	1617000552	126-73-8	Tridecyl phosphate	MG	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
1617000552	1617000552	829-30-4	Tridecane	MG	99	<1.8	11	n/a	n/a	n/a	n/a	1.6	n/a	n/a
1617000552	1617000552	829-76-7	Heptadecane	MG	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
1617000552	1617000552	829-82-8	Pentadecane	MG	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Spencer
 12/1/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-A

Customer Sample ID: 16-08765-1-EFF-A

Sample #	IC	MS	CAS #	Acyclic	Unit	STD %	Block	Result	Replicate	Average	RPD %	Spk Rec %	Det Limit	Con Em %	Qual Flag
VAPOR-TDU 5VQ3A IE															
51617000006			3081-86-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
51617000006			95-48-7	2-Methylphenol	NGS	95	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
51617000006			106-39-4M	Cresol (m & p)	NGS	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
51617000006			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
51617000006			75-45-6	Dibutyl phosphonate	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
51617000006			84-86-2	Diphenylmethane	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
51617000006			112-80-3	Decane	NGS	92	<0.80	12	n/a	n/a	n/a	n/a	0.50	n/a	n/a
51617000006			544-78-3	Hexadecane	NGS	95	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
51617000006			529-39-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
51617000006			726-73-8	Tributyl phosphite	NGS	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
51617000006			529-30-5	Tetralone	NGS	95	<1.8	7.5	n/a	n/a	n/a	n/a	1.8	n/a	n/a
51617000006			529-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
51617000006			529-82-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 M - Mismatched TIC
 NA - Not Analyzed, ND - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:
 Customer Sample ID: 16-08765-1-EFF-B
 Customer Sample ID: 16-08765-1-EFF-B

Sample #	W	AM	Car #	Analyte	Unit	STD %	Stdev	Reprod	Average	RSD %	Spk Res %	Det Limit	Cal Err %	Qual Flags
VAPOR:TDU SYDA #2														
5167000507			3091-06-3	3,8,15-Triethyltoluene	MG5	100	<3.8	<3.8	n/a	n/a	n/a	3.0	n/a	n/a
5167000507			35-49-7	2-Methylphenol	MG5	89	<4.9	<4.9	n/a	n/a	n/a	4.0	n/a	n/a
5167000507			108-39-4M	Cresol (m & p)	MG5	100	<5.8	<5.8	n/a	n/a	n/a	5.0	n/a	n/a
5167000507			30-52-4	Biphenyl	MG5	110	<4.0	<4.0	n/a	n/a	n/a	4.0	n/a	n/a
5167000507			78-49-6	Dibutyl butylphosphonate	MG5	100	<3.8	<3.8	n/a	n/a	n/a	3.0	n/a	n/a
5167000507			84-49-2	Dienyltetraol	MG5	100	<7.0	<7.0	n/a	n/a	n/a	7.0	n/a	n/a
5167000507			112-40-3	Dodecane	MG5	95	<5.0	26	n/a	n/a	n/a	0.00	n/a	n/a
5167000507			544-76-3	Hexadecane	MG5	89	<3.3	<3.3	n/a	n/a	n/a	3.3	n/a	n/a
5167000507			328-39-4	Tetradecane	MG5	100	<3.9	4.3	n/a	n/a	n/a	3.0	n/a	n/a
5167000507			126-73-8	Trisethyl phosphite	MG5	100	<5.8	<5.8	n/a	n/a	n/a	5.0	n/a	n/a
5167000507			528-50-5	Tridecane	MG5	89	<1.8	14	n/a	n/a	n/a	1.0	n/a	n/a
5167000507			528-76-7	Heptadecane	MG5	120	<2.4	<2.4	n/a	n/a	n/a	2.4	n/a	n/a
5167000507			528-82-9	Heptadecane	MG5	94	<3.0	<3.0	n/a	n/a	n/a	3.0	n/a	n/a

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 NA - Not Analyzed, MD - Not Detected
 N - Named TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDC Number:
 Customer Sample ID: 16-08765-1-EFF-C
 Customer Sample ID: 16-08765-1-EFF-G

Sample	R	AM	CSG #	Analyte	Unit	STD %	Bias	Result	Replicate	Average	RSD %	Spn Res %	Det Limit	Con Err %	Qual Flags
VAPOR-TOU SYCAM BE															
2187020008			2001-08-3	2,6,10-Triethyldecane	MG/S	100	-0.9	<0.8	n/a	n/a	n/a	n/a	3.0		n/a U
2187020008			20-08-7	2-Methylhexanol	MG/S	89	-4.9	-4.9	n/a	n/a	n/a	n/a	4.0		n/a U
2187020008			108-26-4M	Cresol (m & p)	MG/S	100	-0.6	-0.6	n/a	n/a	n/a	n/a	5.0		n/a U
2187020008			20-02-4	Biphenyl	MG/S	115	-4.0	-4.0	n/a	n/a	n/a	n/a	4.0		n/a U
2187020008			78-01-6	Diethyl sulphophosphate	MG/S	100	-0.8	-0.8	n/a	n/a	n/a	n/a	3.8		n/a U
2187020008			24-06-2	Diohydroxide	MG/S	100	-7.0	-7.0	n/a	n/a	n/a	n/a	7.0		n/a U
2187020008			113-40-3	Dodecane	MG/S	92	-0.82	29	n/a	n/a	n/a	n/a	0.52		n/a
2187020008			244-76-3	Heptadecane	MG/S	86	-3.3	3.3	n/a	n/a	n/a	n/a	3.3		n/a J
2187020008			202-09-4	Tetradecane	MG/S	100	-0.3	0.8	n/a	n/a	n/a	n/a	3.6		n/a J
2187020008			126-73-8	Tributyl phosphate	MG/S	100	-0.8	-0.8	n/a	n/a	n/a	n/a	5.8		n/a U
2187020008			209-10-5	Tricosane	MG/S	89	-1.8	19	n/a	n/a	n/a	n/a	1.8		n/a
2187020008			209-76-7	Heptadecane	MG/S	120	-2.4	3.8	n/a	n/a	n/a	n/a	2.4		n/a J
2187020008			202-02-8	Pentadecane	MG/S	94	-0.8	5.3	n/a	n/a	n/a	n/a	3.0		n/a J

2 - Coloured
 T - Tentatively ID'd (S) or Colored
 U - Less Than Detection Limit
 NA - Not Analyzed, MD - Not Detected
 N - Named TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161070
 SDG Number:
 Customer Sample ID: 16-08765-1-EFF-0
 Customer Sample ID: 16-08765-1-EFF-0

Sample #	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Std Limit	Std Err	Qual Flags
VAPOR-TOU SYGA.R2														
2161035559		2691-99-3	2,3,10-Trimethyldecane	MGs	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.0	n/a	n/a
2161035559		95-49-7	2-Methylphenol	MGs	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.0	n/a	n/a
2161035559		108-39-4M	Cresol (m & p)	MGs	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.0	n/a	n/a
2161035559		90-52-4	Biphenyl	MGs	116	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
2161035559		78-46-6	Diethyl bisphosphonate	MGs	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.0	n/a	n/a
2161035559		84-66-2	Diethylthiobale	MGs	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
2161035559		113-40-3	Dodecane	MGs	92	<0.60	13	n/a	n/a	n/a	n/a	0.50	n/a	n/a
2161035559		544-76-3	Hexadecane	MGs	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
2161035559		507-99-4	Tetradecane	MGs	100	<3.9	4.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
2161035559		129-73-8	Trimethyl phosphite	MGs	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.0	n/a	n/a
2161035559		509-90-5	Tridecane	MGs	89	<1.6	6.9	n/a	n/a	n/a	n/a	1.6	n/a	n/a
2161035559		509-76-7	Heptadecane	MGs	120	<2.4	2.7	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2161035559		509-82-8	Pentadecane	MGs	94	<3.0	3.8	n/a	n/a	n/a	n/a	3.0	n/a	n/a

MA = Not Analyzed, NP = Not Detected
 B = Missed TIC

J = Less Than Duplicate Limit

T = Tentatively Identified Compound

J = Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162070
 SDO Number:
 Customer Sample ID: 16-08765-1-EFF-E
 Customer Sample ID: 16-08765-1-EFF-E

Sample #	E	AI	Cal #	Analyte	Unit	RTD %	Blank	Reprint	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Em %	Qual Flags
VAPOR-TDU-SVCA-E2															
2181035560			3081-09-3	2,8,10-Trimethyldecane	MGs	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.0		n/a
2181035560			30-46-7	2-Methylphenyl	MGs	89	44.9	44.9	n/a	n/a	n/a	n/a	4.0		n/a
2181035560			108-39-4M	Cresol (m & p)	MGs	100	<3.8	<3.8	n/a	n/a	n/a	n/a	5.0		n/a
2181035560			30-52-4	Biphenyl	MGs	110	44.0	44.0	n/a	n/a	n/a	n/a	4.0		n/a
2181035560			78-46-6	Diethyl Sulphophosphate	MGs	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.0		n/a
2181035560			34-66-2	Diethylthiathale	MGs	100	47.0	47.0	n/a	n/a	n/a	n/a	7.0		n/a
2181035560			113-40-3	Dodecane	MGs	92	<0.60	5.7	n/a	n/a	n/a	n/a	0.50		n/a
2181035560			344-78-3	Hexadecane-	MGs	89	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1		n/a
2181035560			309-38-4	Tetradecane	MGs	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.0		n/a
2181035560			128-73-8	Triethyl phosphate	MGs	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.0		n/a
2181035560			309-50-5	Tridecane	MGs	89	<1.8	3.1	n/a	n/a	n/a	n/a	1.8		n/a
2181035560			309-78-7	Heptadecane	MGs	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
2181035560			309-40-9	Pentadecane	MGs	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 M - Merged TIC
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 30163070
 SDS Number:
 Customer Sample ID: 16-08765-1-EFF-F
 Customer Sample ID: 16-08765-1-EFF-F

Sample #	R	AI	CAS #	Sample	Unit	RTS %	Blank	Result	Extricate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR: TDU /VCOA #2															
5167000561			3007-80-3	2,6,10-Trimethyldecane	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5167000561			30-45-7	2-Methylpentanol	MG5	95	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
5167000561			108-29-4M	Cresol (m & p)	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5167000561			50-52-4	Biphenyl	MG5	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
5167000561			78-48-6	Diethyl sulphophosphate	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5167000561			84-66-2	Diethylthiathole	MG5	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
5167000561			112-40-3	Dodecane	MG5	80	<0.80	23	n/a	n/a	n/a	n/a	0.80		n/a
5167000561			544-78-3	Hexadecane	MG5	95	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
5167000561			5079-29-4	Tetradecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5167000561			126-73-8	Triethyl phosphate	MG5	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5167000561			829-33-5	Tridecane	MG5	89	<1.8	12	n/a	n/a	n/a	n/a	1.8		n/a
5167000561			829-78-7	Heptadecane	MG5	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5167000561			509-62-8	Pentadecane	MG5	94	<3.0	3.2	n/a	n/a	n/a	n/a	3.0		n/a,U

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 N - Named TIC
 NA - Not Analyzed, ND - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:
 Customer Sample ID: 16-08765-1-EFF-G
 Customer Sample ID: 16-08765-1-EFF-G

Sample #	R	M	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spa Rec %	Det Limit	Conc In %	Qual Flag
VAPOR-TOLU SPC-A 02															
2181030562			3881-08-3	D,A, 5,5-Trimethyldecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2181030562			30-46-7	3-Methylphenol	MG5	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
2181030562			109-39-4M	Cresol (m & p)	MG5	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
2181030562			82-82-4	Biphenyl	MG5	116	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
2181030562			78-46-8	Dibutyl butylphosphonate	MG5	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
2181030562			64-66-2	Dithyprithiata	MG5	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
2181030562			112-82-3	Dodecane	MG5	92	<0.60	4.4	n/a	n/a	n/a	n/a	0.60	n/a	n/a
2181030562			344-76-3	Hexadecane	MG5	89	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a
2181030562			629-09-4	Tetradecane	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2181030562			129-73-8	Tributyl phosphite	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2181030562			309-50-5	Tridecane	MG5	89	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181030562			309-76-7	Heptadecane	MG5	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2181030562			309-60-9	Pentadecane	MG5	94	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a

J - Enriched
 T - Transglycisyl Methylol Compound
 U - Less Than Detection Limit
 NA - Not Analyzed, ND - Not Detected
 N - Named TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163079
 SDG Number:
 Customer Sample ID: 16-08765-1-EFF-H
 Customer Sample ID: 16-08765-1-EFF-H

Sample#	R	M	CAS #	Analysis	Unit	STD %	Blank	Pass/Fail	Duplicate	Average	BP0 %	Spk Rec %	Det Limit	Car Err %	Qual Flags
VAPOR-TDU SWCHA EQ															
2187030663			2881-88-3	2,6,10-Trimethyldecane	WGS	100	<0.9	<0.9	n/a	n/a	n/a	n/a	3.8		n/a,U
2187030663			95-48-7	3-Methylpentane	WGS	86	<4.9	<4.9	n/a	n/a	n/a	n/a	4.8		n/a,U
2187030663			108-28-6M	Creosol (m & p)	WGS	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
2187030663			90-02-4	Biphenyl	WGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
2187030663			78-48-8	Dibutyl Sulfophosphate	WGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
2187030663			94-66-2	Dioctylphthalate	WGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
2187030663			112-45-3	Decane	WGS	90	<0.80	12	n/a	n/a	n/a	n/a	0.50		n/a
2187030663			544-78-3	Hexadecane	WGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
2187030663			229-28-4	Tetradecane	WGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
2187030663			126-73-8	Tributyl phosphate	WGS	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
2187030663			829-85-8	Tridecane	WGS	86	<1.8	5.9	n/a	n/a	n/a	n/a	1.8		n/a,U
2187030663			229-78-7	Heptadecane	WGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
2187030663			829-82-9	Pentadecane	WGS	94	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 NA - Not Analyzed, MD - Not Detected
 N - Named PIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:
 Customer Sample ID: 16-08765-1-IN-A
 Customer Sample ID: 16-08765-1-IN-A

Sample#	R	AF	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VAPOR-TDU SIVCA.RG															
2187030564			1081-08-3	2,4,10-Trimethyldecane	MG/S	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2187030564			30-43-7	2-Methylpropanol	MG/S	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
2187030564			108-29-4M	Cholesterol (m & p)	MG/S	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
2187030564			30-43-4	Epinephyl	MG/S	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
2187030564			78-48-8	Diethyl butylphosphonate	MG/S	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2187030564			34-66-2	Diethylphthalate	MG/S	100	<7.5	<7.5	n/a	n/a	n/a	n/a	7.5	n/a	n/a
2187030564			112-40-3	Docosane	MG/S	92	<0.60	20	n/a	n/a	n/a	n/a	0.50	n/a	n/a
2187030564			544-76.3	Hexadecane	MG/S	89	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a
2187030564			309-09-4	Tridecane	MG/S	100	<3.9	4.2	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2187030564			128-73-8	Triethyl phosphite	MG/S	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2187030564			629-50-8	Tridecane	MG/S	89	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187030564			309-78-7	Heptadecane	MG/S	100	<3.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2187030564			309-40-9	Pentadecane	MG/S	84	<3.8	3.3	n/a	n/a	n/a	n/a	3.0	n/a	n/a

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 N - Named TIC
 NA - Not Analyzed, MD - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:
 Customer Sample ID: 16-08765-1-IN-H
 Customer Sample ID: 16-08765-1-IN-H

Sample #	E	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Replicate	Average	RPD %	Spk Res %	Det Limit	Col Eff %	Qual Flags
VAPOR:TDU-SVCH.r2															
5187030665			3087-80-3	2,8,12-Trimethyldecane	Y05	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5187030665			95-45-7	3-Methylhexyl	Y05	89	4.9	4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
5187030665			100-39-6M	Crisol (m & p)	Y05	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5187030665			92-92-4	3Hexyl	Y05	110	4.0	4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
5187030665			78-48-4	Dibutyl Sulfophosphate	Y05	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5187030665			94-66-2	Dialkylphthalate	Y05	100	47.5	47.0	n/a	n/a	n/a	n/a	7.0		n/a,U
5187030665			112-45-3	Decane	Y05	92	<0.60	18	n/a	n/a	n/a	n/a	0.50		n/a
5187030665			94-178-3	Hexadecane	Y05	89	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1		n/a,U
5187030665			329-28-4	Tetradecane	Y05	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5187030665			329-73-8	Triethyl phosphate	Y05	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5187030665			929-92-9	Tricosane	Y05	89	<1.8	13	n/a	n/a	n/a	n/a	1.8		n/a
5187030665			329-18-7	Heptadecane	Y05	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5187030665			329-82-9	Pentadecane	Y05	94	<3.9	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 NA - Not Analyzed, ND - Not Detected
 N - Normal TIC

Opinion
 12/1/14

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:

Customer Sample ID: 16-00765-1-EFF-A
 Customer Sample ID: 16-00765-1-EFF-A

Sample #	Alt	OC Type	Analyte	Cal No.	Unit	Retention Time (Minutes)	Result	Qual Flag
VAPOR: TDU BYOD: 62								
2181030506			Cyclohexane, hexamethyl-	641-05-8	MG/S	2.84	39	OKT
2181030506			Cyclohexane, octamethyl	559-87-2	MG/S	4.34	45	OKT
2181030506			Cyclohexane, 1-methyl-4-(1-methyl	7705-74-8	MG/S	4.84	43	OKT
2181030506			Decane, 2,4,6-trimethyl-	83168-27-4	MG/S	5.04	19	OKT
2181030506			Decane	1129-21-4	MG/S	5.43	19	OKT
2181030506			Decamethylcyclopentadecane	641-02-8	MG/S	6.70	51	OKT
2181030506			1,3-dibromobenzene	273-84-2	MG/S	6.58	26	OKT
2181030506			Dodecane, 2,6,11-trimethyl-	31295-98-4	MG/S	8.68	17	OKT
2181030506			Undecane, 2-methyl-	9449-71-8	MG/S	7.25	17	OKT
2181030506			Propanoic acid, 2-methyl-, 1-(3-031-40-1	MG/S	8.17	37	OKT
2181030506	BLM6		Chrysene-D12	1714-03-5	MG/S	14.55	24	
2181030506	BLM6		Perylene-D12	1325-98-3	MG/S	15.79	43	

U - Less Than Detection Limit
 T - Cannot be Identified Completely
 MA - Not Analyzed, MD - Not Detected
 N - Manual TIC
 J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:

Customer Sample ID: 16-08765-1-EFF-B
 Customer Sample ID: 16-08765-1-EFF-B

Sample #	R	AI	GC Type	Analyte	Call No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VAPOR: TOU BYOA B2									
218170205587				Cyclohexanone, octamethyl	308-87-2	4.34	MG/S	48	JNT
218170205587				Cyclohexane, 1-methyl-2-(1-met	3481-27-4	4.84	MG/S	77	JNT
218170205587				2,6-Dimethyldecane	33185-81-7	5.04	MG/S	47	JNT
218170205587				Decane, 2,4,6-trimethyl-	82168-27-4	5.20	MG/S	34	JNT
218170205587				Decane, 2,6,7-trimethyl-	82168-29-2	5.32	MG/S	40	JNT
218170205587				Undecane	1129-21-4	5.44	MG/S	77	JNT
218170205587				Hydroxylamine, O-decyl-	29813-79-1	5.49	MG/S	36	JNT
218170205587				Undecane, 2,6-dimethyl-	17891-23-4	5.57	MG/S	27	JNT
218170205587				Decamethylcyclopentadecane	841-02-6	5.71	MG/S	69	JNT
218170205587				1,2-Dibromohexane	373-98-2	6.59	MG/S	51	JNT
218170205587				Decane, 2,7,10-trimethyl-	7445-89-0	6.89	MG/S	32	JNT
218170205587				Decane, 3,6,11-trimethyl-	31286-68-4	7.26	MG/S	34	JNT
218170205587				Undecane, 2-methyl-	7043-71-8	7.32	MG/S	13	JNT
218170205587				Chrysene-D12	3718-03-5	14.03	MG/S	24	
218170205587				PERYLENE-D12	3324-99-3	15.79	MG/S	43	

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
 NA - Not Analyzed, MD - Not Detected
 N - Named TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162070
 SGC Number:

Customer Sample ID: 16-08763-1-EFF-C
 Customer Sample ID: 16-08763-1-EFF-C

Sample	B	AJ	GC Type	Sample	Call No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VAPOR-TOU: 3/10/14 07									
2167000008				Cyclohexanone, octamethyl	508-87-2	4.34	MG08	34	OKT
2167000008				D-Limonene	5086-27-5	4.84	MG08	44	OKT
2167000008				Decane, 2,4,6-trimethyl	5158-27-4	5.04	MG08	11	OKT
2167000008				Acetophenone	99-06-2	5.18	MG08	57	OKT
2167000008				Undecane	1129-27-4	5.44	MG08	27	OKT
2167000008				Nonanal	138-19-8	5.49	MG08	27	OKT
2167000008				Decamethylcyclopentadecane	541-03-8	5.71	MG08	63	OKT
2167000008				1,3-Dinitrobenzene	273-19-2	6.59	MG08	45	OKT
2167000008				Dodecane, 2,7,10-trimethyl-	1489-88-0	6.89	MG08	25	OKT
2167000008				1-Iodo-2-methylundecane	2159-87-8	7.25	MG08	27	OKT
2167000008				Undecane, 3,7-dimethyl-	1791-29-9	7.32	MG08	9,6	OKT
2167000008				Dodecane, 3,8,11-trimethyl-	21265-98-4	7.39	MG08	7,9	OKT
2167000008				Propenoic acid, 2-methyl-, 1:1	10281-40-1	9.17	MG08	36	OKT
2167000008			BLNK	Chrysene-D12	1719-53-8	14.03	MG08	24	
2167000008			BLNK	Phytol-D12	1502-86-3	15.79	MG08	4,2	

J - Estimated
 Y - Tentatively Identified Compound
 U - Less Than Detection Limit
 NA = Not Analyzed, ND = Not Detected
 N = Named TIC

01-Dec-2016 14:4544
 DSRVCHardcopy 3.0.13
 DSR_Jar v. 3.0.13

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070
 SDG Number:

Customer Sample ID: 16-08765-1-EFF-D
 Customer Sample ID: 16-08765-1-EFF-D

Sample	B	AJ	GC Type	Sample	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VAPOUR-TDU SYDIA BQ									
2147020009				Cyclohexanone, octamethyl	588-87-2	4.34	PG25	29	OKT
2147020009				D-Limonene	5085-27-5	4.84	PG25	47	OKT
2147020009				Decane, 2,4,6-trimethyl	21108-27-4	5.04	PG25	50	OKT
2147020009				Acetophenone	99-06-2	5.15	PG25	5.5	OKT
2147020009				Undecane	1129-71-4	5.44	PG25	23	OKT
2147020009				Decamethylpiperidopyrene	641-69-6	5.79	PG25	49	OKT
2147020009				1,2-Dioxolane	273-14-2	5.58	PG25	30	OKT
2147020009				Decane, 2,6,11-trimethyl	31295-98-4	6.89	PG25	17	OKT
2147020009				Undecane, 2-methyl	9485-71-8	7.26	PG25	19	OKT
2147020009				Propenoic acid, 3-methyl, 1,4	54381-80-1	8.17	PG25	30	OKT
2147020009			BLMC	Chrysene-D12	7119-82-5	14.03	PG25	24	
2147020009			BLMC	Pyrene-D12	1533-98-3	15.76	PG25	4.3	

NA = Not Analyzed, ND = Not Detected
 N = Named TIC

U = Less Than Detection Limit

T = Tentatively Identified Compound

J = Estimable

01-Dec-2016 14:45:44
 DSRTChemistry 3.0.13
 DSR_Jar v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08763-1-EFF-E

Customer Sample ID: 16-08763-1-EFF-E

Sample #	Alt	GC Type	Sample	Carb No.	Retention Time (Minutes)	Unit	Result	Qual Flags
SOP: TDU SYDA B2								
2167200000			Undecane	1120-31-4	5.43	MG25	5.4 JNT	
2167200000			Dodecane	141-63-8	5.70	MG25	5.7 JNT	
2167200000			Undecane, 2,8-dimethyl-	17301-23-4	6.28	MG25	6.5 JNT	
2167200000			Dodecane, 2,4,6-trimethyl-	20106-27-4	6.89	MG25	7.1 JNT	
2167200000			Undecane, 2-methyl-	2965-71-8	7.24	MG25	7.4 JNT	
2167200000		BLK	Chrysene-D12	1719-02-9	14.03	MG25	24	
2167200000		BLK	Phytol-D12	1620-86-3	15.79	MG25	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected
 M = Merged TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162070
 SDC Number:

Customer Sample ID: 16-08765-1-EFF-F
 Customer Sample ID: 16-08765-1-EFF-F

Sample #	AB	GC Type	Analyte	Cal# No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU: SYDA: 01								
5187020561			Cyclohexane, octamethyl	505-47-2	4.34	PG25	25	INT
5187020561			D-Limonene	5085-27-5	4.84	PG25	26	INT
5187020561			Decane, 2,4,6-trimethyl-	51108-27-4	5.04	PG25	11	INT
5187020561			Undecane	11265-21-4	5.44	PG25	28	INT
5187020561			Decamethylcyclopentadecane	541-62-6	5.79	PG25	49	INT
5187020561			1,3-Diacetoxystyrene	572-94-2	6.59	PG25	25	INT
5187020561			Decane, 2,6,11-trimethyl-	51256-58-4	6.88	PG25	18	INT
5187020561			Undecane, 2-methyl-	7045-71-8	7.25	PG25	15	INT
5187020561		BLANK	Chrysenes-D12	1719-03-6	14.00	PG25	24	
5187020561		BLANK	Perylene-D12	5020-98-3	15.79	PG25	42	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

NA - Not Analyzed, ND - Not Detected
 N - Named TIC

01-Dec-2016 14:4544
 DSRTCHardware 3.0.13
 DGR-JBR v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160070
 SOG Number:

Customer Sample ID: 16-00765-1-EFF-G
 Customer Sample ID: 16-00765-1-EFF-G

Sample	ID	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SYDIA IQ									
161035602				Cyclohexane, hexamethyl-	541-05-9	2.86	MC5	25	JWT
161035602				Cyclohexane, octamethyl	506-07-2	4.35	MC5	41	JWT
161035602				Decane, 2,4,6-trimethyl	37126-37-4	5.04	MC5	23	JWT
161035602				Undecane	1126-21-4	5.44	MC5	24	JWT
161035602				Undecane, 2,6-dimethyl-	17261-23-4	5.46	MC5	9.1	JWT
161035602		BLNK		Chrysene-D12	1779-09-9	14.63	MC5	24	
161035602		BLNK		Perylene-D12	1829-98-3	15.79	MC5	4.2	

J - Error 603

T - Tentatively Identified Compound

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected
 N = Named TIC

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162070
 SOG Number:

Customer Sample ID: 16-08765-1-EFF-H
 Customer Sample ID: 16-08765-1-EFF-H

Sample #	AI	GC Type	Sample	CAI No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TRU SYSTEM								
518753563			D-Limonene	1089-37-5	4.84	MG5	25	JNT
518753563			Decane, 2,4,6-trimethyl-	62108-27-4	5.04	MG5	7.5	JNT
518753563			Undecane	1320-31-8	5.44	MG5	95	JNT
518753563			Decamethylpentalane	341-82-8	5.79	MG5	30	JNT
518753563			Docosane, 2,6,11-trimethyl-	13290-08-4	8.88	MG5	11	JNT
518753563		BLNK	Chrysenes-D12	1719-89-6	14.03	MG5	26	
518753563		BLNK	Phytolene-D12	1520-86-3	15.79	MG5	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected
 N = Named TIC

01-Dec-2016 14:4544
 DSRT-Chromcopy 3.0.13
 DSRLJ81 v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-IN-A

Customer Sample ID: 16-08765-1-IN-A

Sample	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
MPCPS-100 SYCOA.R2									
21671035064				2-Butoxyethanol	111-76-2	3.69	MG/G	7.2	JRT
21671035064				Cyclohexanone, octamethyl	368-67-2	4.34	MG/G	26	JRT
21671035064				D-Limonene	3099-27-5	4.84	MG/G	32	JRT
21671035064				Decane, 2,4,6-trimethyl	307106-27-4	5.19	MG/G	6.3	JRT
21671035064				Undecane	1129-21-4	5.44	MG/G	24	JRT
21671035064				Decamethylcyclopentadecane	641-62-6	6.70	MG/G	92	JRT
21671035064				Dodecane, 2,6,11-trimethyl	31285-59-4	6.88	MG/G	15	JRT
21671035064				Undecane, 2-methyl	7945-71-8	7.29	MG/G	13	JRT
21671035064				Propanoic acid, 2-methyl, 1-(14281-60-1	8.17	MG/G	60	JRT
21671035064		BLWC		Chrysene-D12	1719-03-5	14.03	MG/G	24	
21671035064		BLWC		Pyrene-D12	1500-96-3	15.79	MG/G	4.2	

J = Estimated
 T = Tentatively Identified Compound
 U = Less Than Detection Limit
 NA = Not Analyzed, ND = Not Detected
 H = Heated TIC

01-Dec-2016 14:4544
 DSRTIC-Hardware 3.0.13
 DSR-JAR v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162070
 SDG Number:
 Customer Sample ID: 16-08765-1-IN-H
 Customer Sample ID: 16-08765-1-IN-H

Sample #	AB	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SYDIA 67								
216700066			DLimonene	5089-27-5	4.84	MG/S	52	PKT
216700066			Decane, 2,4,6-trimethyl-	52108-27-4	5.04	MG/S	6.2	PKT
216700066			Undecane	1120-21-4	5.44	MG/S	17	PKT
216700066			Undecane, 2-methyl-	7945-71-8	7.25	MG/S	12	PKT
216700066	BLWC		Chrysene-D12	1779-03-5	14.53	MG/S	24	
216700066	BLWC		Pyrene-D12	1829-98-3	15.79	MG/S	4.2	

J = Estimated
 T = Tentatively Identified Compound
 U = Less Than Detection Limit
 M = Not Analyzed, MD = Not Detected
 N = Normal TIC

Spencer
 12/6/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160071
 SDC Number:
 Customer Sample ID: 16-08766-1-BASE-EFF
 Customer Sample ID: 16-08766-1-BASE-EFF

Sample	R	Alt	Lab #	Sample	Lot	SDS %	Blank	Result	Duplicate	Average	RPD %	Spn Res %	Det Limit	Col Eff %	Qual Flags
VAPOR-EDU SVDA, BC															
S167000066				0871-08-3	NO3	90	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a
S167000066				03-48-7	NO3	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a
S167000066				128-39-4M	NO3	120	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0		n/a
S167000066				02-12-4	NO3	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a
S167000066				78-48-6	NO3	92	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a
S167000066				04-06-2	NO3	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a
S167000066				112-69-3	NO3	92	<0.00	12	n/a	n/a	n/a	n/a	0.00		n/a
S167000066				044-76-3	NO3	82	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a
S167000066				029-09-4	NO3	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a
S167000066				128-73-8	NO3	96	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0		n/a
S167000066				029-02-5	NO3	92	<1.8	7.4	n/a	n/a	n/a	n/a	1.8		n/a
S167000066				029-76-7	NO3	86	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
S167000066				029-62-9	NO3	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162071
 SDC Number:
 Customer Sample ID: 16-08766-1-BASE-IN
 Customer Sample ID: 16-08766-1-BASE-IN

Sample	R	M	Case #	Analyte	Unit	STD %	Blank	Result	Suppliate	Average	RFD %	Spk Rec %	Det Limit	Car Err %	Qual Flags
VAPOR-TDU SVOA EQ															
5187035567			5871-88-3	2,6,10-Trimethyldecane	MG	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5187035567			58-48-7	2-Methylhexane	MG	100	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
5187035567			709-39-4M	Creosol (m & p)	MG	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5187035567			52-52-4	Biphenyl	MG	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
5187035567			78-48-8	Diethyl butylphosphonate	MG	92	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5187035567			84-66-2	Diallylphthalate	MG	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
5187035567			112-69-3	Dodecane	MG	93	<0.60	0.7	n/a	n/a	n/a	n/a	0.60		n/a,U
5187035567			544-78-3	Heptadecane	MG	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
5187035567			839-69-4	Tetradecane	MG	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5187035567			509-73-8	Triethyl phosphite	MG	96	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5187035567			529-92-8	Tridecane	MG	92	<1.8	5.3	n/a	n/a	n/a	n/a	1.8		n/a,U
5187035567			826-78-7	Heptadecane	MG	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5187035567			529-82-8	Pentadecane	MG	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162071
 SDD Number:
 Customer Sample ID: 16-08766-1-BLANK-EFF
 Customer Sample ID: 16-08766-1-BLANK-EFF

Sample #	AM	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spot Area %	Est Limit	Est Err %	Qual Flags
2181030568			1,6,6,6-Tetrahydroxycyclohexane	MCIS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2181030568			2,4,6-Trinitrophenol	MCIS	100	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
2181030568			2-Methylthiophene	MCIS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2181030568			2-Methyl-2-butanol	MCIS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	90	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	90	<0.00	0.00	n/a	n/a	n/a	n/a	0.00	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	80	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	90	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	80	<3.4	<3.4	n/a	n/a	n/a	n/a	3.4	n/a	n/a
2181030568			2-Methyl-2-propanol	MCIS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 28162871
 SDG Number:
 Customer Sample ID: 16-08766-1-BLANK-IN
 Customer Sample ID: 16-08766-1-BLANK-IN

Sample	R	AI	Cal #	Analyte	Unit	STD %	Blank	Result	Substrate	Average	RSD %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VAPOR-TDU STD.A.B2															
2187020569			1691-68-3	2,6,10-Trimethyldecane	MG	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a
2187020569			65-48-7	2-Methylhexanol	MG	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a
2187020569			109-29-4M	Creosol (m & p)	MG	132	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a
2187020569			82-52-4	Biphenyl	MG	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a
2187020569			78-48-6	Diethyl butylphosphonate	MG	92	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a
2187020569			84-66-2	Diethylphthalate	MG	92	<7.9	<7.9	n/a	n/a	n/a	n/a	7.9		n/a
2187020569			112-62-3	Dodecane	MG	92	<0.80	<0.80	n/a	n/a	n/a	n/a	0.80		n/a
2187020569			644-78-3	Heptadecane	MG	85	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a
2187020569			829-59-4	Tetradecane	MG	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a
2187020569			129-73-6	Triethyl phosphite	MG	96	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a
2187020569			829-50-6	Tridecane	MG	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2187020569			829-78-7	Heptadecane	MG	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
2187020569			829-62-8	Pentadecane	MG	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a

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U - Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162071
 SDC Number:
 Customer Sample ID: 16-08766-1-IN-B
 Customer Sample ID: 16-08766-1-IN-B

Sample	R	MI	CAS #	Analyte	Unit	STD %	Blank	Result	Substrate	Average	RPD %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VIA-Q8-110J SYGA.B2															
S1810205170			587-88-3	2,4,6-Trimethyltoluene	%OS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S1810205170			55-49-7	2-Methylphenol	%OS	100	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
S1810205170			100-39-4M	Cresol (m & p)	%OS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S1810205170			80-52-4	Biphenyl	%OS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S1810205170			18-48-8	Diethyl butylphosphonate	%OS	92	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S1810205170			84-69-2	Diethylphthalate	%OS	92	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S1810205170			112-62-3	Dodecane	%OS	92	<0.90	1.3	n/a	n/a	n/a	n/a	0.90	n/a	n/a
S1810205170			544-76-3	Heptadecane	%OS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S1810205170			829-89-4	Tetradecane	%OS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S1810205170			109-73-8	Triethyl phosphite	%OS	96	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S1810205170			829-82-8	Tridecane	%OS	93	<1.8	3.0	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S1810205170			829-78-7	Heptadecane	%OS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S1810205170			829-82-8	Pentadecane	%OS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163071
 SDC Number:
 Customer Sample ID: 16-08766-1-IN-C
 Customer Sample ID: 16-08766-1-IN-C

Sample	R	MP	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Split Rec %	Out Limit	Out Err %	Qual Flags
VA-09-TCU SYDIA.R															
S187006071			5871-98-3	2,6,10-Triethyldecane	%OS	92	<-3.3	<-3.3	n/a	n/a	n/a	n/a	3.6		n/a/U
S187006071			58-49-7	2-Methylphenol	%OS	122	<-4.9	<-4.9	n/a	n/a	n/a	n/a	4.5		n/a/U
S187006071			100-39-6M	Cresol (m & p)	%OS	129	<-5.8	<-5.8	n/a	n/a	n/a	n/a	5.8		n/a/U
S187006071			90-52-4	Biphenyl	%OS	92	<-4.0	<-4.0	n/a	n/a	n/a	n/a	4.0		n/a/U
S187006071			78-49-6	Diethyl sulphophosphate	%OS	92	<-3.6	<-3.6	n/a	n/a	n/a	n/a	3.6		n/a/U
S187006071			84-66-2	Diethylphthalate	%OS	92	<-7.0	<-7.0	n/a	n/a	n/a	n/a	7.0		n/a/U
S187006071			112-40-3	Decalane	%OS	93	<-0.00	19	n/a	n/a	n/a	n/a	0.56		n/a
S187006071			544-76-3	Heptadecane	%OS	83	<-3.3	<-3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
S187006071			829-89-4	Tetradecane	%OS	91	<-3.9	8.4	n/a	n/a	n/a	n/a	3.9		n/a/U
S187006071			129-73-8	Triethyl phosphite	%OS	96	<-5.8	<-5.8	n/a	n/a	n/a	n/a	5.8		n/a/U
S187006071			829-82-8	Tridecane	%OS	92	<-1.8	32	n/a	n/a	n/a	n/a	1.8		n/a/U
S187006071			829-78-7	Heptadecane	%OS	86	<-2.4	<-2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S187006071			829-82-8	Tridecane	%OS	91	<-3.5	3.3	n/a	n/a	n/a	n/a	3.5		n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162071
 SDG Number:
 Customer Sample ID: 16-08766-1-JN-E
 Customer Sample ID: 16-08766-1-JN-E

Sample	R	M	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flags
MAPOR-TDU 5VQA.EQ															
2187035573			1091-98-3	2,4,6-Trimethyldecane	MG	95	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a
2187035573			93-48-7	2-Methylhexane	MG	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a
2187035573			709-39-4M	2-methyl (m & p)	MG	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a
2187035573			95-53-4	2-phenyl	MG	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a
2187035573			79-48-6	Dibutyl isylphosphonate	MG	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a
2187035573			34-96-2	Dimethylphthalate	MG	95	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a
2187035573			112-60-3	Dodecane	MG	93	<0.60	11	n/a	n/a	n/a	n/a	0.60		n/a
2187035573			344-76-3	Heptadecane	MG	85	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a
2187035573			309-59-4	Tridecane	MG	91	<3.9	3.8	n/a	n/a	n/a	n/a	3.9		n/a
2187035573			129-73-8	Tributyl phosphite	MG	96	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a
2187035573			309-50-3	Tridecane	MG	92	<1.8	6.0	n/a	n/a	n/a	n/a	1.8		n/a
2187035573			309-76-7	Heptadecane	MG	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
2187035573			309-60-8	Pentadecane	MG	91	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163071
 SDC Number:
 Customer Sample ID: 16-08766-1-IN-F
 Customer Sample ID: 16-08766-1-IN-F

Sample	R	MP	CAS#	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spn Bias %	Det Limit	Col Eff %	Qual Flags
VAPOR-TOU SYDAR															
S181006074			5891-98-3	2,6,10-Trimethyldecane	%OS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S181006074			55-48-7	2-Methylphenol	%OS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
S181006074			169-39-6M	Cresol (m, p)	%OS	120	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
S181006074			80-52-4	Biphenyl	%OS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S181006074			78-46-6	Diethyl isulphosphonate	%OS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
S181006074			84-66-2	Diethylphthalate	%OS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S181006074			112-46-3	Diethylurea	%OS	93	<6.00	24	n/a	n/a	n/a	n/a	6.00	n/a	n/a
S181006074			544-76-3	Heptadecane	%OS	65	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S181006074			829-89-4	Tetradecane	%OS	91	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
S181006074			129-73-8	Triethyl phosphite	%OS	96	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
S181006074			829-82-8	Tridecane	%OS	93	<1.8	7.5	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S181006074			829-78-7	Heptadecane	%OS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S181006074			829-82-9	Pentadecane	%OS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

John J. Guff
 12/16/16

Sample Group: 20163072
 SDG Number:
 Customer Sample ID: 16-08766-1-EFF-A
 Customer Sample ID: 16-08766-1-EFF-A

Sample	R	MF	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flags
VAPOR-TOU SVOA BE															
S187000076			5871-68-3	2,6,10-Triethyldecane	ug/g	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			55-48-7	2-Methylphenol	ug/g	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S187000076			100-39-4M	Cresol (m & p)	ug/g	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			80-52-4	Biphenyl	ug/g	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S187000076			78-46-6	Diethyl butylphosphonate	ug/g	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			84-66-3	Diethylphthalate	ug/g	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S187000076			112-40-3	Decalane	ug/g	100	<0.00	0	n/a	n/a	n/a	n/a	0.00	n/a	U
S187000076			544-76-3	Hexachlorcyclopentadiene	ug/g	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			809-69-4	Tetrahaloethane	ug/g	130	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			128-73-8	Triethyl phosphite	ug/g	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S187000076			829-60-5	Trisecane	ug/g	80	<1.0	0.8	n/a	n/a	n/a	n/a	1.0	n/a	U
S187000076			829-76-7	Heptadecane	ug/g	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S187000076			829-62-8	Pentadecane	ug/g	130	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

N = Normal TIC
 U = Less Than Detection Limit

c = RPD Outside Range
 J = Estimated

MA = Not Analyzed, ND = Not Detected
 T = Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 26163072
 SDG Number:
 Customer Sample ID: 16-06766-1-EFF-B
 Customer Sample ID: 16-06766-1-EFF-B

Sample	R	AI	CAI #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Car Err %	Qual Flag
Vial(08-10) SPC24 B2															
S161005677			309-46-3	2,6,10-Trimethyldecane	µG/S	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S161005677			35-46-7	3-Methylphenol	µG/S	150	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	J
S161005677			198-39-6M	Cresol (m, p)	µG/S	100	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	J
S161005677			62-53-4	Biphenyl	µG/S	120	<6.0	<6.0	n/a	n/a	n/a	n/a	6.0	n/a	J
S161005677			78-46-6	Diethyl isopropylphosphonate	µG/S	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S161005677			84-96-2	Dimethylphthalate	µG/S	150	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	J
S161005677			112-40-3	Decane	µG/S	100	<0.80	17	n/a	n/a	n/a	n/a	0.50	n/a	J
S161005677			244-76-3	Heptadecane	µG/S	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S161005677			829-69-4	Tetradecane	µG/S	150	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S161005677			126-73-6	Triethyl phosphite	µG/S	110	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	J
S161005677			829-62-6	Tridecane	µG/S	90	<1.8	3.7	n/a	n/a	n/a	n/a	1.8	n/a	J
S161005677			829-78-7	Heptadecane	µG/S	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S161005677			829-82-9	Nonadecane	µG/S	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J

M = Not Analyzed, ND = Not Detected
 T = Tentatively Identified Compound

J - Estimated

G - RPD Outside Range

M = Named TIC
 U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 26163072
 SDX Number:
 Customer Sample ID: 16-08766-1-EFF-C
 Customer Sample ID: 16-08766-1-EFF-C

Sample #	AI	CA#	Analyte	Unit	RTD %	Stdev	Resolv	Duplicate	Average	RPD %	Spk Res %	Det Limit	Con Fir %	Qual Flag
1617035078		3281-58-3	2,6,10-Triethyldecane	µg/g	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.9	n/a	U
1617035078		19-48-7	2-Methylphthal	µg/g	150	<4.0	<4.0	n/a	n/a	n/a	n/a	4.9	n/a	U
1617035078		709-39-4M	Creosol (m, p)	µg/g	100	<3.0	<3.0	n/a	n/a	n/a	n/a	5.8	n/a	U
1617035078		82-82-4	Biphenyl	µg/g	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
1617035078		78-48-6	Dibutyl butylphosphonate	µg/g	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.8	n/a	U
1617035078		84-96-2	Diethylphthalate	µg/g	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
1617035078		112-45-3	Dodecane	µg/g	100	<0.80	19	n/a	n/a	n/a	n/a	0.50	n/a	U
1617035078		344-78-3	Hexadecane	µg/g	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
1617035078		829-89-4	Tetradecane	µg/g	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
1617035078		129-73-8	Triethyl phosphate	µg/g	110	<5.0	<5.0	n/a	n/a	n/a	n/a	5.8	n/a	U
1617035078		829-89-5	Trisecane	µg/g	88	<1.8	13	n/a	n/a	n/a	n/a	1.8	n/a	U
1617035078		829-78-7	Heptadecane	µg/g	110	<3.4	<3.4	n/a	n/a	n/a	n/a	2.4	n/a	U
1617035078		829-82-9	Pentadecane	µg/g	120	<3.0	3.4	n/a	n/a	n/a	n/a	3.0	n/a	U

M = Not Analyzed, ND = Not Detected
 T = Tentatively Identified Compound

J = Estimated

c = RPD Outside Range

M = Named TIC
 U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160072
 SDG Number:
 Customer Sample ID: 16-08766-1-EFF-F
 Customer Sample ID: 16-08766-1-EFF-F

Sample #	R	AI	Cell #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Concn %	Qual Flag
VW-CR-10J 5V25A BE															
S167030581			109-1-08-3	2,3,10-Trimethylidocane	µG/GS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S167030581			85-48-7	2-Methylphenol	µG/GS	150	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	J
S167030581			708-29-4M	Cresol (m & p)	µG/GS	100	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	J
S167030581			62-53-4	Biphenyl	µG/GS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	J
S167030581			78-46-4	Diethyl butylphosphonate	µG/GS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S167030581			84-98-2	Dialkylphthalates	µG/GS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	J
S167030581			112-40-3	Dodecane	µG/GS	100	<0.80	12	n/a	n/a	n/a	n/a	0.50	n/a	J
S167030581			544-76-3	Hexadecane	µG/GS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S167030581			829-88-4	Tetradecane	µG/GS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S167030581			126-73-6	Tributyl phosphite	µG/GS	150	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	J
S167030581			829-82-5	Tribecane	µG/GS	90	<1.8	8.1	n/a	n/a	n/a	n/a	1.8	n/a	J
S167030581			829-78-7	Heptadecane	µG/GS	150	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S167030581			829-62-9	Pentadecane	µG/GS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J

N = Not Analyzed, ND = Not Detected
 T = Tentatively Identified Compound

J = Estimated

c = RPD Outside Range

N = Named TIC
 U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160072
 SDG Number:
 Customer Sample ID: 16-08766-1-EFF-G
 Customer Sample ID: 16-08766-1-EFF-G

Sample #	AI	CA# #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Std Dev %	Est Limit	Est Err %	Qual Flag
VolPac: TDJ 3VGA 62														
S161030582		2091-05-3	2,4,6-Trimethyltoluene	μG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.5	n/a	n/a
S161030582		75-48-7	2-Methylphenol	μG25	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S161030582		100-30-4M	Cresol (m & p)	μG25	100	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	n/a
S161030582		80-82-4	Biphenyl	μG25	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S161030582		78-48-8	Diethyl butylphosphonate	μG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S161030582		84-85-2	Diallyl phosphonate	μG25	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S161030582		112-60-3	Dodecane	μG25	100	<0.60	20	n/a	n/a	n/a	n/a	0.55	n/a	n/a
S161030582		84-76-3	Nonadecane	μG25	120	<3.1	<3.1	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S161030582		829-59-4	Pentadecane	μG25	130	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S161030582		128-73-8	Tetradyl phosphate	μG25	110	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0	n/a	n/a
S161030582		829-59-5	Tridecane	μG25	90	<1.0	3.1	n/a	n/a	n/a	n/a	1.0	n/a	n/a
S161030582		829-76-7	Heptadecane	μG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S161030582		829-60-9	Pentadecane	μG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

N/A = Not Analyzed, MD = Not Detected
 F = Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N = Named TIC
 U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160372
 SDO Number:
 Customer Sample ID: 16-08766-1-EFF-H
 Customer Sample ID: 16-08766-1-EFF-H

Sample #	AI	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Res %	Det Limit	Est Err %	Qual Flags
VAMPOR-TDU STDs 02														
S161030583		3891-08-3	2,3,5-Trimethylphosphate	µG25	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S161030583		85-48-7	2-Methylphosphol	µG25	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.9	n/a	n/a
S161030583		108-39-6M	Cresol (m & p)	µG25	100	<5.0	<5.0	n/a	n/a	n/a	n/a	5.8	n/a	n/a
S161030583		52-53-4	Isophenyl	µG25	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S161030583		78-48-8	Diethyl isopropylphosphonate	µG25	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S161030583		84-66-3	Dimethylphthalate	µG25	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S161030583		112-40-3	Dodecane	µG25	100	<0.80	7.7	n/a	n/a	n/a	n/a	0.55	n/a	n/a
S161030583		844-79-3	Hexadecane	µG25	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S161030583		829-59-4	Tetradecane	µG25	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S161030583		328-73-8	Tributyl phosphate	µG25	110	<5.0	<5.0	n/a	n/a	n/a	n/a	5.6	n/a	n/a
S161030583		829-50-5	Tridecane	µG25	98	<1.6	3.7	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S161030583		829-78-7	Heptadecane	µG25	110	<3.4	<3.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S161030583		829-83-9	Pentadecane	µG25	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

N = Named TIC
 U = Less Than Detection Limit
 6 = RPO Outside Range
 J = Estimated
 MA = Not Analyzed, MD = Not Detected
 F = Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 30163072
 SDC Number:
 Customer Sample ID: 16-08766-1-IN-A
 Customer Sample ID: 16-08766-1-IN-A

Sample#	R	AI	Gas #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Col Err %	Qual Flags
VAPOR: TCU S/COA #2															
5161000004			3891-86-3	2,6,10-Trimethyldecane	NG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a/U
5161000004			35-48-7	3-Methylphenol	NG25	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a/U
5161000004			106-39-6M	Cresol (m & p)	NG25	100	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0		n/a/U
5161000004			50-63-4	Biphenyl	NG25	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a/U
5161000004			78-48-8	Dibutyl butylphosphonate	NG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a/U
5161000004			84-65-2	Diethylmalonate	NG25	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a/U
5161000004			512-49-3	Decane	NG25	100	<3.00	18	n/a	n/a	n/a	n/a	9.00		n/a
5161000004			544-79-3	Hexadecane-	NG25	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
5161000004			629-59-4	Tetradecane	NG25	100	<3.0	4.5	n/a	n/a	n/a	n/a	3.0		n/a/U
5161000004			526-73-8	Tributyl phosphate	NG25	110	<5.0	<5.0	n/a	n/a	n/a	n/a	5.0		n/a/U
5161000004			609-90-5	Tricane	NG25	90	<1.0	20	n/a	n/a	n/a	n/a	1.0		n/a
5161000004			629-78-7	Heptadecane	NG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
5161000004			629-60-8	Peradecane	NG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a/U

W - Named TIC
 U - Less Than Detection Limit
 e - RPO Outside Range
 J - Estimated
 MA - Not Analyzed, ND = Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163872
 SDC Number:
 Customer Sample ID: 16-08766-1-IN-H
 Customer Sample ID: 16-08766-1-IN-H

Sample	R	M	Car #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	App. Res %	Det. Limit	Con. Err %	Qual. Flags
VAPOR-TDU SDC# 62															
S161000005			3891-85-3	2,4,6-Trimethyltoluene	NG25	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S161000005			85-48-7	2-Methylphenol	NG25	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
S161000005			508-39-6M	Cresol (m & p)	NG25	100	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
S161000005			82-62-4	o-phenyl	NG25	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S161000005			78-48-8	Diethyl hydrophosphonate	NG25	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S161000005			84-66-3	Dithyphthalate	NG25	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S161000005			112-60-3	Dodecane	NG25	100	<0.00	16	n/a	n/a	n/a	n/a	0.00	n/a	n/a
S161000005			344-76-3	Hexadecane	NG25	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S161000005			629-59-4	Tetradecane	NG25	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S161000005			126-73-8	Tributyl phosphate	NG25	110	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
S161000005			629-50-5	Tricosane	NG25	80	<1.8	13	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161000005			629-76-7	Heptadecane	NG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S161000005			629-62-8	Phenadecane	NG25	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a

N - Named TIC
 U - Less Than Detection Limit
 4 - RPD Outside Range
 J - Estimated
 NA - Not Analyzed, ND - Not Detected
 T - Tentatively Identified Compound

John Dwyer
 12/14/14

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163472

SDG Number:

Customer Sample ID: 16-08766-1-EFF-A
 Customer Sample ID: 16-08766-1-EFF-A

Sample#	R	Alt	GC Type	Analyte	Calb No.	Retention Time (Minutes)	Units	Result	Qual (Flag)
VAPOR-TOU INOVA 42									
S161005076				Cyclohexanone, hexamethyl-	341-02-6	2.86	MG	26	✔
S161005076				Cyclohexanone, octamethyl	366-87-2	4.32	MG	26	✔
S161005076				D-Limonene	5089-27-5	4.85	MG	26	✔
S161005076				Undecane, 2,8-dimethyl-	17301-23-4	5.43	MG	15	✔
S161005076				Decamethylcyclopentadecane	341-03-6	6.71	MG	42	✔

W - Named TIC
 U - Less Than Detection Limit

6 - NPQ Outside Range

J - Estimated

NA = Not Analyzed, ND = Not Detected
 F = Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-B

Customer Sample ID: 16-08766-1-EFF-B

Sample #	AI	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU SIVCA 10								
S-161703057			Cyclohexane, hexamethyl-	541-02-9	2.85	MG	28	JNT
S-161703057			Cyclohexane, octamethyl-	508-97-2	4.33	MG	34	JNT
S-161703057			D-Limonene	5880-27-3	4.88	MG	28	JNT
S-161703057			Undecane	1120-21-4	5.45	MG	22	JNT
S-161703057			Decamethylcyclopentasiloxane	341-02-8	5.71	MG	44	JNT

N - Named TIC
 U - Less Than Detection Limit

e - NPD Outside Range

J - Estimated

NA - Not Analyzed, ND = Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-C

Customer Sample ID: 16-08766-1-EFF-C

Sample	R	AI	GC Type	Sample	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPORLTDU SYGA R2									
S161000078				Cyclohexane, hexamethyl-	541-02-9	2.86	MG5	26	JNT
S161000078				Cyclohexane, octamethyl-	568-07-2	4.36	MG5	30	JNT
S161000078				D-Limonene	508-27-5	4.85	MG5	26	JNT
S161000078				Undecane, 2,6-dimethyl-	17001-20-4	5.21	MG5	8,9	JNT
S161000078				Undecane	1120-21-4	5.43	MG5	31	JNT
S161000078				Decamethylpentacontane	541-02-8	5.71	MG5	47	JNT
S161000078				1,2-Dibenzofuran	372-18-2	6.66	MG5	27	JNT
S161000078				Dodecane, 2,6,11-trimethyl-	15268-08-4	6.99	MG5	58	JNT

R - Retained TIC
 U - Less Than Detection Limit

4 - RPD Outside Range

J - Estimated

NA - Not Analyzed, ND - Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-E

Customer Sample ID: 16-08766-1-EFF-E

Sample#	R	AI	GC Type	Sample	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VAPOR-TOU SVCA IQ									
5187000080				Cyclohexane, hexamethyl-	541-05-9	2.88	MG8	50.0NT	
5187000080				Undecane	1129-21-4	5.45	MG8	9.3.0NT	
5187000080				Decamethylcyclopentisiloxane	541-02-8	5.71	MG8	36.0NT	

H - Named TIC
 U - Less Than Retention Limit

s - NPQ Outside Range

J - Estimated

NA = Not Analyzed, ND = Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08706-1-EFF-F

Customer Sample ID: 16-08706-1-EFF-F

Sample#	B	Alt	GC Type	Analyte	Carb No.	Retention Time (minutes)	Unit	Result	Qual Flags
VMFOR-100 SYDA 82									
5181000581				Cyclohexane, hexamethyl-	341-02-9	2.88	%GS	43	JNT
5181000581				Cyclohexane, octamethyl-	368-07-2	4.38	%GS	30	JNT
5181000581				Undecane	1120-21-4	8.48	%GS	13	JNT
5181000581				Decamethylcyclopentasiloxane	341-02-8	8.71	%GS	30	JNT

N - Named TIC
 U - Less Than Detection Limit

e - RFG Outside Range

J - Estimated

NA - Not Analyzed, ND - Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072
 SDG Number:

Customer Sample ID: 16-08766-1-EFF-G
 Customer Sample ID: 16-08766-1-EFF-G

Sample#	R	AI	QC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flag
VAPOR:TDU BYVA IQ									
8181000002				Cyclohexane, hexamethyl-	341-02-9	2.88	MG5	32	JNT
8181000002				Cyclohexane, octamethyl	368-87-2	4.38	MG5	47	JNT
8181000002				D,Limonene	588-27-5	4.48	MG5	26	JNT
8181000002				Undecane, 4,7-dimethyl-	17301-33-9	5.08	MG5	52	JNT
8181000002				Decane, 2,4,6-trimethyl-	82108-27-4	5.10	MG5	23	JNT
8181000002				Undecane	1120-21-4	5.48	MG5	59	JNT
8181000002				Dodecylcyclopentasiloxane	341-02-8	6.72	MG5	40	JNT

R - Named TIC
 U - Less Than Detection Limit

e - RPQ Outside Range

J - Estimated

NA - Not Analyzed, ND - Not Detected
 T - Transmethylated Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-H

Customer Sample ID: 16-08766-1-EFF-H

Sample#	R	M	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VIA-POR:TOU 5VQA #2									
S161700563				Cyclohexane, hexamethyl-	341-05-9	2.86	NO3	52	_PNT
S161700563				Cyclohexane, octamethyl-	356-87-2	4.36	NO3	26	_PNT
S161700563				Undecane	1126-21-4	5.45	NO3	14	_PNT

H - Named TIC
 U - Less Than Detection Limit

c - 80% Outside Range

J - Estimated

MA - Not Analyzed, MD - Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161072
 SDG Number:

Customer Sample ID: 16-08764-1-IN-A
 Customer Sample ID: 16-08764-1-IN-A

Sample#	SI	AI	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
SAPOR-TDU 21/24 #2									
218700004				Cyclohexane, hexamethyl-	341-05-9	2.88	%GS	48	JNT
218700004				Cyclohexane, octamethyl	268-87-2	4.38	%GS	42	JNT
218700004				3,4-Dioxane	3089-27-5	4.85	%GS	30	JNT
218700004				Undecane	7120-21-4	5.45	%GS	19	JNT
218700004				Dodecylheptacosane	341-02-8	5.71	%GS	41	JNT
218700004				Propenoic acid, 2-methyl, 1-1	74871-03-1	9.19	%GS	26	JNT

M - Named TIC
 U - Less Than Detection Limit

e - RPO Outside Range

J - Estimated

NA - Not Analyzed, ND = Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163072
 SDG Number:

Customer Sample ID: 16-00766-1-JN-H
 Customer Sample ID: 16-00766-1-JN-H

Sample#	SI	MI	QC Type	Sample	Cartridge	Retention Time (Minutes)	Test	Result	Qual Flags
VIAPOUR-TDU 31704 #2									
8181000065				Cyclotrioxane, hexamethyl-	341-05-9	2.86	PODS	43	JNT
8181000066				Cyclotrioxane, octamethyl-	366-87-2	4.38	PODS	37	JNT
8181000065				Ureoxane	1129-21-4	5.45	PODS	16	JNT
8181000065				Decamethylcyclopentasiloxane	341-02-8	6.71	PODS	30	JNT

R - Named TIC
 U - Less Than Detection Limit

e - ISTD Outside Range

J - Estimated

NA - Not Analyzed, ND - Not Detected
 T - Tentatively Identified Compound

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-BAISE-EFF
 Customer Sample ID: 16-08766-2-BAISE-EFF

Sample #	AI	Lab #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Ret Limit	Col Eff %	Qual Flags
2187035518			71-43-2 Benzene	MO5	85	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
2187035518			100-47-0 Benzotoluene	MO5	85	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
2187035518			123-73-8 Ethylal	MO5	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
2187035518			109-14-6 Suberone	MO5	87	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
2187035518			56-23-5 Carbon tetrachloride	MO5	112	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			108-90-7 Chlorobenzene	MO5	87	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			75-00-3 Chloroethane	MO5	87	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
2187035518			87-46-3 Chlorobenzene	MO5	112	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			110-82-7 Cyclohexane	MO5	92	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			124-18-5 Decane	MO5	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
2187035518			84-17-5 Ethanol	MO5	100	<7.4	15	n/a	n/a	n/a	n/a	n/a	7.4	n/a
2187035518			141-78-6 Ethyl acetate	MO5	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			100-41-4 Ethylbenzene	MO5	92	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
2187035518			119-00-9 Furfural	MO5	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			150-34-3 Hexane	MO5	85	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
2187035518			828-73-9 Heptane	MO5	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			120-88-7 Methylcyclohexane	MO5	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			75-08-2 Methylene Chloride	MO5	92	<2.7	4.9	n/a	n/a	n/a	n/a	n/a	2.7	n/a
2187035518			91-20-3 Naphthalene	MO5	84	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
2187035518			88-89-3 Nitrobenzene	MO5	85	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
2187035518			110-89-8 Pentane	MO5	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			107-12-0 Propanenitrile	MO5	95	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a
2187035518			110-85-1 Pyridine	MO5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
2187035518			100-42-5 Styrene	MO5	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			127-18-4 Tetrachloroethane	MO5	98	<1.8	12	n/a	n/a	n/a	n/a	n/a	1.8	n/a
2187035518			108-88-3 Toluene	MO5	82	<1.5	1.7	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			79-47-6 Trichloroethane	MO5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
2187035518			75-69-4 Trichloroethane	MO5	93	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LL8 Outside Range
 NA - Not Analyzed, MD - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160067
 SDG Number:
 Customer Sample ID: 16-08768-2-BASE-EFF
 Customer Sample ID: 16-08768-2-BASE-EFF

Sample #	R	M	Car #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Col Err %	Qual Flags
VAPOR-TDU/VQA-18															
218700018			10061-01-5	cis-1,3-Dichloropentane	ug/g	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U
218700018			10061-01-4	n-Butyl acetate	ug/g	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
218700018			142-83-0	n-Hexane	ug/g	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
218700018			10061-02-6	trans-1,3-Dichloropentane	ug/g	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U

J - Estimated
 G - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLB Outside Range
 H - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-BASE-IN
 Customer Sample ID: 16-08766-2-BASE-IN

Sample	S	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Std Limit	Col Str %	Qual Flags
VAPOR-TDU/VQA (E)															
2161000019			75-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			75-00-5	1,1,2-Trichloroethane	NGS	94	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
2161000019			75-34-3	1,1-Dichloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			107-06-3	1,3-Dichlorobenzene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000019			943-79-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			108-95-7	1,4-Dichlorobenzene	NGS	95	<2.5	<2.0	n/a	n/a	n/a	n/a	2.5		n/a
2161000019			123-91-1	1,4-Dioxane	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
2161000019			71-36-3	1-Pentanol	NGS	140	<8.9	34	n/a	n/a	n/a	n/a	8.9		n/a
2161000019			111-75-6	1-Heptanol	NGS	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a
2161000019			71-23-9	1-Propanol	NGS	100	<3.0	20	n/a	n/a	n/a	n/a	3.0		n/a
2161000019			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a
2161000019			108-29-8	2,5-Dihydrofuran	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a
2161000019			75-83-3	2-Butanone	NGS	94	<1.9	2.8	n/a	n/a	n/a	n/a	1.9		n/a
2161000019			110-43-0	2-Heptanone	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000019			591-78-6	2-Nonanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			204-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000019			75-84-4	2-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
2161000019			106-35-4	2-Heptanone	NGS	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
2161000019			106-65-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
2161000019			105-92-0	4-Methyl-2-hexanone	NGS	85	<1.3	2.8	n/a	n/a	n/a	n/a	1.3		n/a
2161000019			156-10-1	4-Methyl-2-pentanone	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000019			87-64-1	Acetone	NGS	81	<4.3	26	n/a	n/a	n/a	n/a	4.3		n/a
2161000019			75-05-8	Acetonitrile	NGS	81	<1.8	36	n/a	n/a	n/a	n/a	1.8		n/a
2161000019			98-86-2	Acetophenone	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a
2161000019			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
2161000019			107-18-6	Methyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a
2161000019			107-05-1	Methyl Chloride	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a

J - Estimated
 G - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 MA - Not Analyzed, NG - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-BASE-IN
 Customer Sample ID: 16-08766-2-BASE-IN

Sample #	AM	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Rpl Rec %	Ret Limit	Cartridge Eval Flag
VOCs-TPH VOCs IE													
161000019		71-43-2	Benzene	ug/L	92	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a
161000019		100-47-0	Benzonitrile	ug/L	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
161000019		103-72-6	Butanal	ug/L	100	<2.1	2.3	n/a	n/a	n/a	n/a	2.1	n/a
161000019		109-14-0	Butanenitrile	ug/L	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
161000019		56-23-6	Carbon tetrachloride	ug/L	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
161000019		108-90-7	Chlorobenzene	ug/L	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000019		75-00-3	Chloroethane	ug/L	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
161000019		87-86-3	Chloroform	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000019		110-83-7	Cyclohexane	ug/L	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000019		124-18-6	Decane	ug/L	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
161000019		64-17-6	Ethanol	ug/L	100	<7.4	13	n/a	n/a	n/a	n/a	7.4	n/a
161000019		54-178-6	Ethyl acetate	ug/L	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000019		100-41-4	Ethylbenzene	ug/L	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000019		116-20-8	Furan	ug/L	86	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000019		116-94-3	Hexane	ug/L	80	<1.7	2.4	n/a	n/a	n/a	n/a	1.7	n/a
161000019		828-73-8	Hexanenitrile	ug/L	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000019		126-85-7	Methacrylonitrile	ug/L	97	<1.8	1.9	n/a	n/a	n/a	n/a	1.8	n/a
161000019		75-09-2	Methylene Chloride	ug/L	90	<2.7	4.1	n/a	n/a	n/a	n/a	2.7	n/a
161000019		91-20-3	Naphthalene	ug/L	86	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
161000019		96-82-3	Nitrobenzene	ug/L	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
161000019		119-29-8	Permethrin	ug/L	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000019		165-12-0	Propenenitrile	ug/L	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
161000019		119-38-1	Pyridine	ug/L	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
161000019		100-42-6	Styrene	ug/L	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000019		127-18-4	Tetrachloroethane	ug/L	90	<1.8	8.5	n/a	n/a	n/a	n/a	1.8	n/a
161000019		108-88-3	Toluene	ug/L	85	<1.5	3.0	n/a	n/a	n/a	n/a	1.5	n/a
161000019		79-01-6	Trichloroethane	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000019		75-68-4	Trichloroethylene	ug/L	80	<1.8	8.1	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 # - LCS Outside Range
 NA - Not Analyzed, MD = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-68766-2-BASE-IN
 Customer Sample ID: 16-68766-2-BASE-IN

Sample	R	AM	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Con Err %	Qual Flags
VAPOR-TDU/VQA IQ															
2181005519			10061-01-5	cis-1,3-Dichloropentane	MG5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
2181005519			100-80-4	n-Butyl acetate	MG5	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2181005519			143-82-9	n-Hexane	MG5	84	<1.4	2.8	n/a	n/a	n/a	n/a	1.4		n/a/J
2181005519			10061-02-6	trans-1,3-Dichloropentane	MG5	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U

J - Estimated
 G - Qualifier

U - Less Than Detection Limit
 E - Outside Calibration Range

L - LLL Outside Range

NA - Not Analyzed, ND - Not Detected
 B - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162967
 SDG Number:
 Customer Sample ID: 16-08766-3-BLANK-EFF
 Customer Sample ID: 16-08766-3-BLANK-EFF

Sample #	AI	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	BPO %	Split Bias %	Det Limit	Cal Err %	Qual Flags
51817000020		79-34-5	1,1,2,2-Tetrachloroethane	MGs	66	<1.3	<1.3	n/a	n/a	n/a	n/a			n/a,U
51817000020		79-00-6	1,1,2-Trichloroethane	MGs	66	<1.5	<1.5	n/a	n/a	n/a	n/a			n/a,U
51817000020		79-34-3	1,1-Dichloroethane	MGs	67	<1.3	<1.3	n/a	n/a	n/a	n/a			n/a,U
51817000020		79-36-4	1,1-Dichloroethane	MGs	67	<1.3	<1.3	n/a	n/a	n/a	n/a			n/a,U
51817000020		107-06-2	1,2-Dichloroethane	MGs	110	<1.6	<1.6	n/a	n/a	n/a	n/a			n/a,U
51817000020		240-75-6	1,3-Dichloropropane (Total)	MGs	n/a	n/a	<1.2	n/a	n/a	n/a	n/a			n/a,U
51817000020		108-66-7	1,4-Dichlorobenzene	MGs	66	<2.0	<2.0	n/a	n/a	n/a	n/a			n/a,U
51817000020		123-91-1	1,4-Dioxane	MGs	100	<1.7	<1.7	n/a	n/a	n/a	n/a			n/a,U
51817000020		71-36-3	1-Butanol	MGs	146	<6.9	13	n/a	n/a	n/a	n/a			n/a,J
51817000020		111-70-9	1-Heptanol	MGs	67	<6.6	<6.8	n/a	n/a	n/a	n/a			n/a,J
51817000020		71-23-6	1-Propanol	MGs	100	<3.0	28	n/a	n/a	n/a	n/a			n/a,U
51817000020		108-67-4	2,4-Dimethylpyridine	MGs	94	<3.3	<3.3	n/a	n/a	n/a	n/a			n/a,U
51817000020		1708-26-8	2,5-Dihydrofuran	MGs	66	<2.8	<2.8	n/a	n/a	n/a	n/a			n/a,U
51817000020		78-93-3	2-Butanone	MGs	94	<1.9	<1.9	n/a	n/a	n/a	n/a			n/a,U
51817000020		116-43-0	2-Heptanone	MGs	66	<1.6	<1.6	n/a	n/a	n/a	n/a			n/a,U
51817000020		201-78-6	2-Hexanone	MGs	85	<1.3	<1.3	n/a	n/a	n/a	n/a			n/a,U
51817000020		534-23-9	2-Methylfuran	MGs	91	<1.9	<1.9	n/a	n/a	n/a	n/a			n/a,U
51817000020		78-04-4	2-Buten-2-one	MGs	66	<1.7	<1.7	n/a	n/a	n/a	n/a			n/a,U
51817000020		108-36-4	3-Heptanone	MGs	84	<1.5	<1.5	n/a	n/a	n/a	n/a			n/a,U
51817000020		108-69-3	3-Octanone	MGs	67	<2.4	<2.4	n/a	n/a	n/a	n/a			n/a,U
51817000020		101-42-0	4-Methyl-2-pentanone	MGs	66	<1.3	2.7	n/a	n/a	n/a	n/a			n/a,J
51817000020		108-10-1	4-Methyl-2-pentanone	MGs	94	<1.9	<1.9	n/a	n/a	n/a	n/a			n/a,U
51817000020		67-64-1	Acetone	MGs	81	<4.3	34	n/a	n/a	n/a	n/a			n/a,U
51817000020		75-05-8	Acetonitrile	MGs	81	<1.8	660	n/a	n/a	n/a	n/a			n/a,E
51817000020		98-86-2	Acetophenone	MGs	66	<2.8	<2.8	n/a	n/a	n/a	n/a			n/a,U
51817000020		107-13-1	Acrylonitrile	MGs	90	<1.7	<1.7	n/a	n/a	n/a	n/a			n/a,U
51817000020		107-18-6	Allyl Alcohol	MGs	110	<3.9	<3.9	n/a	n/a	n/a	n/a			n/a,U
51817000020		107-02-1	Allyl Chloride	MGs	66	<2.8	<2.8	n/a	n/a	n/a	n/a			n/a,U

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 a - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-BLANK-EFF
 Customer Sample ID: 16-08766-2-BLANK-EFF

Sample	SI	AM	Cal #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Exp Rec %	Det Limit	Con Fir %	Qual Flags
VAPOR-100 VQA ID															
5181000500		71-43-2		Benzene	MOB	90	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5181000500		100-47-0		Benzonitrile	MOB	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		123-73-8		BuAnal	MOB	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
5181000500		108-74-0		BuAcetnitrile	MOB	97	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5181000500		56-23-5		Carbon tetrachloride	MOB	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		108-90-7		Chlorobenzene	MOB	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		75-00-3		Chloroethane	MOB	87	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5181000500		57-66-3		Chloroform	MOB	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		110-80-7		Cylohexane	MOB	90	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		124-18-0		Decane	MOB	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5181000500		84-12-9		Ethanol	MOB	90	<1.8	2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
5181000500		141-78-8		Ethyl acetate	MOB	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		100-41-4		Ethylbenzene	MOB	90	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		110-00-8		Furan	MOB	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		110-04-3		Hexane	MOB	90	<1.7	2.1	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5181000500		508-73-8		Hexanetriole	MOB	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		126-88-7		Methacrylonitrile	MOB	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		75-08-2		Methylene Chloride	MOB	90	<2.7	8.2	n/a	n/a	n/a	n/a	n/a	2.7	n/a
5181000500		81-26-3		Naphthalene	MOB	88	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
5181000500		88-68-3		Nitrobenzene	MOB	86	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5181000500		110-89-8		Pentamethyl	MOB	90	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		507-12-0		Propargenitrile	MOB	90	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a
5181000500		110-85-1		Pyridine	MOB	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
5181000500		500-42-0		Styrene	MOB	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		521-58-4		Tetrahydrofuran	MOB	90	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181000500		108-88-3		Toluene	MOB	90	<1.5	1.7	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		79-07-6		Trichloroethane	MOB	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181000500		75-69-4		Trichlorofluoromethane	MOB	90	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 a - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163967
 SDG Number:
 Customer Sample ID: 16-08766-2-BLANK-EFF
 Customer Sample ID: 16-08766-3-BLANK-EFF

Sample#	SI	AM	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cor Err %	Qual Flags
MAPOR-TDU VQA B1															
161039530			10061-01-5	cis-1,3-Dichloropropene	MG	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
161039530			103-04-4	n-Butyl Acetate	MG	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a
161039530			143-02-0	n-Heptane	MG	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a
161039530			10061-02-6	trans-1,3-Dichloropropene	MG	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a

J - Estimated
 G - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLB Outside Range
 H - LCS Outside Range
 NA - Not Analyzed, ND - Not Detected
 B - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-BLANK-IN
 Customer Sample ID: 16-08766-2-BLANK-IN

Sample #	AI	MS	CAS #	Analysis	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Est Limit	Est Err %	Qual Flags
1617035521			75-34-5	1,1,2,3-Tetrahydroethane	MG	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
1617035521			75-05-5	1,1,2-Trichloroethane	MG	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
1617035521			75-34-3	1,1-Dichloroethane	MG	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
1617035521			75-35-4	1,1-Dichloroethane	MG	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
1617035521			501-96-2	1,2-Dichloroethane	MG	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
1617035521			542-75-6	1,3-Dichloropropane (Total)	MG	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a
1617035521			509-98-7	1,4-Dichlorobenzene	MG	95	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a
1617035521			123-91-1	1,4-Dioxane	MG	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
1617035521			71-36-3	1-Butanol	MG	140	<8.9	47	n/a	n/a	n/a	n/a	8.9		n/a
1617035521			111-70-8	1-Heptanol	MG	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a
1617035521			71-23-8	1-Propanol	MG	120	<3.0	32	n/a	n/a	n/a	n/a	3.0		n/a
1617035521			108-87-4	2,4-Dimethylpyridine	MG	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a
1617035521			1768-201-8	2,5-Dihydrofuran	MG	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a
1617035521			78-83-3	2-Butanone	MG	94	<1.9	2.1	n/a	n/a	n/a	n/a	1.9		n/a
1617035521			119-83-0	2-Heptanone	MG	88	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
1617035521			504-78-6	2-Heptanone	MG	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
1617035521			504-33-0	2-Methylfuran	MG	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
1617035521			78-94-4	3-Buten-2-one	MG	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
1617035521			106-38-4	3-Heptanone	MG	88	<1.5	4.0	n/a	n/a	n/a	n/a	1.5		n/a
1617035521			109-69-3	3-Octanone	MG	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
1617035521			109-43-0	4-Methyl-2-Pentanone	MG	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a
1617035521			108-10-1	4-Methyl-2-Pentanone	MG	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
1617035521			87-64-1	Acetone	MG	81	<4.3	36	n/a	n/a	n/a	n/a	4.3		n/a
1617035521			75-05-8	Acetonitrile	MG	81	<1.8	86	n/a	n/a	n/a	n/a	1.8		n/a
1617035521			89-86-2	Acetophenone	MG	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a
1617035521			507-13-1	Acrylonitrile	MG	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a
1617035521			507-18-8	Methyl Alcohol	MG	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a
1617035521			707-05-1	Methyl Chloride	MG	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a

J - Estimated
 Q - Qualitative
 L - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 # - LCS Outside Range
 NA - Not Analyzed, MD - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SIDG Number:
 Customer Sample ID: 16-08766-2-BLANK-IN
 Customer Sample ID: 16-08766-2-BLANK-IN

Sample#	S	AI	Gas #	Analysis	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Ret. Limit	Col Err %	Qual Flags
VAPOR:TDU VOA 82															
5161005521			71-43-2	Benzene	MG5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
5161005521			100-47-0	Benzonitrile	MG5	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			123-73-8	Buflinal	MG5	100	<2.1	2.1	n/a	n/a	n/a	n/a	2.1		n/a,J
5161005521			109-74-6	Buflometilolol	MG5	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
5161005521			56-23-5	Carbon tetrachloride	MG5	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
5161005521			108-90-7	Chlorobenzene	MG5	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			75-00-3	Chloroethane	MG5	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
5161005521			87-86-3	Chlorobrom	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			110-83-7	Cyclohexane	MG5	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161005521			124-18-5	Decane	MG5	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
5161005521			64-17-5	Ethanol	MG5	100	<7.4	26	n/a	n/a	n/a	n/a	7.4		n/a
5161005521			141-78-4	Ethyl acetate	MG5	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			100-41-4	Ethylbenzene	MG5	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			115-00-9	Furan	MG5	86	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161005521			150-54-3	Hexane	MG5	85	<1.7	2.1	n/a	n/a	n/a	n/a	1.7		n/a,J
5161005521			508-73-9	Heptamethyl	MG5	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			128-86-7	Methacrylonitrile	MG5	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161005521			75-09-2	Methylene Chloride	MG5	90	<2.7	9.6	n/a	n/a	n/a	n/a	2.7		n/a,J
5161005521			91-20-3	Naphthalene	MG5	84	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a,U
5161005521			99-85-3	Nitrobenzene	MG5	80	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
5161005521			110-98-8	Permethrin	MG5	85	<1.8	2.6	n/a	n/a	n/a	n/a	1.8		n/a,J
5161005521			107-13-0	Propene	MG5	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
5161005521			119-85-1	Pyridine	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a,U
5161005521			100-42-5	Styrene	MG5	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161005521			127-18-4	Tetrachloroethane	MG5	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161005521			108-88-3	Toluene	MG5	85	<1.5	5.5	n/a	n/a	n/a	n/a	1.5		n/a,J
5161005521			79-01-6	Trichloroethane	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161005521			75-09-4	Trichlorofluoromethane	MG5	93	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 NA - Not Analyzed, MD = Not Detected
 # - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160067
 SDG Number:
 Customer Sample ID: 16-08766-2-BLANK-IN
 Customer Sample ID: 16-08766-2-BLANK-IN

Sample	S	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Col Err %	Qual Flags
VAPOR: TOU VQA IE															
2187000021			10061-01-5	ole-1,3-Dichloropentane	MGDS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
2187000021			123-86-4	n-Butyl acetate	MGDS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2187000021			143-83-3	n-Hexane	MGDS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2187000021			10061-02-6	trans-1,3-Dichloropentane	MGDS	170	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U

J - Estimated
 Q - Qualitative

U - Less Than Detection Limit
 E - Outside Calibration Range

L - LLS Outside Range

NA - Not Analyzed, ND - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-B
 Customer Sample ID: 16-08766-2-IN-B

Sample #	AM	CAS #	Analysis	Unit	RPD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Bar %	Qual Flags
VAPORS-TDU VOA-B														
1617035522		75-34-5	1,1,2,2-Tetrachloroethane	MG/L	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		75-35-5	1,1,2-Trichloroethane	MG/L	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617035522		75-34-3	1,1-Dichloroethane	MG/L	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		75-35-4	1,1-Dichloroethane	MG/L	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		107-56-2	1,2-Dichloroethane	MG/L	115	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617035522		343-75-6	1,3-Dichloropropene (Total)	MG/L	n/a	n/a	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		106-66-7	1,4-Dichlorobenzene	MG/L	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
1617035522		123-91-1	1,4-Dioxane	MG/L	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617035522		71-36-3	1-Butanol	MG/L	145	<6.9	1.0	n/a	n/a	n/a	n/a	6.9	n/a	n/a
1617035522		111-70-8	1-Heptanol	MG/L	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
1617035522		71-23-8	1-Propanol	MG/L	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
1617035522		108-87-4	3,4-Dimethylpyridine	MG/L	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
1617035522		1758-29-8	2,5-Dihydrofuran	MG/L	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617035522		78-03-3	2-Butanone	MG/L	94	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a	n/a
1617035522		119-83-0	2-Heptanone	MG/L	86	<1.8	2.0	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617035522		585-78-8	3-Hexanone	MG/L	85	<1.3	2.8	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		534-23-5	3-Methylbutane	MG/L	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
1617035522		78-94-4	3-Butyl-2-one	MG/L	89	<1.7	8.1	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617035522		156-38-4	3-Heptanone	MG/L	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617035522		136-48-3	3-Octanone	MG/L	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
1617035522		165-42-0	4-Methyl-2-hexanone	MG/L	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617035522		168-16-1	4-Methyl-2-pentanone	MG/L	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
1617035522		87-64-1	Acetone	MG/L	81	<4.3	35	n/a	n/a	n/a	n/a	4.3	n/a	n/a
1617035522		75-05-8	Acetonitrile	MG/L	81	<1.8	1.8E+03	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617035522		98-86-2	Acetophenone	MG/L	89	<2.8	7.2	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617035522		107-13-1	Arylonitrile	MG/L	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617035522		107-18-8	Methyl Alcohol	MG/L	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
1617035522		107-09-1	Methyl Chloride	MG/L	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 # - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected
 # - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201610067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-B
 Customer Sample ID: 16-08766-2-IN-B

Sample #	R	M	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	High Rec %	Ret Limit	Carrier %	Qual Flags
VAPOR-TDU VDA IS															
1187000022			71-43-2	Benzene	MG5	90	<1.2	3.9	n/a	n/a	n/a	n/a	1.2	n/a	Q
1187000022			100-47-0	Benzonitrile	MG5	88	<1.8	<1.9	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			123-73-8	Buflinal	MG5	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	Q
1187000022			108-74-0	Butanenitrile	MG5	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	Q
1187000022			56-23-5	Carbon tetrachloride	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			108-90-7	Chlorobenzene	MG5	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			75-00-3	Chloroethane	MG5	97	<1.8	<1.9	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			97-86-3	Chloroform	MG5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			110-83-7	Cyclohexane	MG5	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			124-18-5	Decane	MG5	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Q
1187000022			84-17-9	Ethanol	MG5	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	Q
1187000022			141-78-8	Ethyl acetate	MG5	81	<1.5	97	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			100-41-4	Ethylbenzene	MG5	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			710-00-9	Furan	MG5	88	<1.8	4.0	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			110-54-3	Hexane	MG5	80	<1.7	20	n/a	n/a	n/a	n/a	1.7	n/a	Q
1187000022			838-73-8	Heptanenitrile	MG5	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			736-88-7	Methoxybenzene	MG5	97	<1.8	3.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			75-08-2	Methylene Chloride	MG5	90	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	Q
1187000022			91-26-3	Naphthalene	MG5	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	Q
1187000022			88-85-3	Nitrobenzene	MG5	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Q
1187000022			110-89-8	Pentanitrile	MG5	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			107-12-0	Propanenitrile	MG5	90	<1.4	1.9	n/a	n/a	n/a	n/a	1.4	n/a	Q
1187000022			110-86-1	Pyridine	MG5	100	<3.8	5.8	n/a	n/a	n/a	n/a	3.8	n/a	Q
1187000022			100-42-5	Styrene	MG5	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			121-18-4	Tetrachloroethane	MG5	89	<1.8	4.8	n/a	n/a	n/a	n/a	1.8	n/a	Q
1187000022			108-88-3	Toluene	MG5	80	<1.5	3.8	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			78-01-6	Trichloroethane	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	Q
1187000022			75-69-4	Trifluoromethane	MG5	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	Q

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - LCS Outside Range
 NA - Not Analyzed, MD - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SIDG Number:
 Customer Sample ID: 16-08766-2-IN-B
 Customer Sample ID: 16-08766-2-IN-B

Sample#	R	AI	Gas #	Analysis	Unit	95% %	Blank	Result	Duplicate	Average	RPD %	Sign Rate %	Est Limit	Est Err %	Qual Flags
VAPOR: TDU VDA #2															
8167000022			10081-01-5	Isr-1,3-Dichloropropene	MG5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a(OU)
8167000022			123-00-4	n-Butyl acetate	MG5	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a(OU)
8167000022			142-00-5	n-Heptane	MG5	84	<1.4	17	n/a	n/a	n/a	n/a	1.4		n/a(D)
8167000022			10081-02-6	trans-1,3-Dichloropropene	MG5	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a(OU)

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 NA - Not Analyzed, MD - Not Detected
 # - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-C
 Customer Sample ID: 16-08766-2-IN-C

Sample #	SI	MI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rate %	Std Limit	Col Err %	Qual Flags
VAPOR-TDU VOA.R															
5181005823			79-34-5	1,1,2,2-Tetrachloroethane	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181005823			79-09-5	1,1,2-Trichloroethane	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181005823			79-34-3	1,1-Dichloroethane	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181005823			79-35-4	1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181005823			707-56-2	1,2-Dichloroethane	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181005823			843-79-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181005823			508-85-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
5181005823			5-23-81-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181005823			71-36-3	1-Butanol	NGS	140	<8.9	300	n/a	n/a	n/a	n/a	8.9	n/a	n/a
5181005823			511-79-6	1-Heptanol	NGS	87	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
5181005823			71-23-9	1-Propanol	NGS	120	<3.6	28	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5181005823			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5181005823			1708-29-8	2,5-Dihydrofuran	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181005823			78-83-3	2-Butanone	NGS	94	<1.9	8.4	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181005823			510-43-6	2-Heptanone	NGS	88	<1.6	3.1	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181005823			591-78-8	2-Hexanone	NGS	85	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181005823			534-23-6	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181005823			78-84-4	2-Buten-2-one	NGS	89	<1.7	3.5	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181005823			106-30-4	2-Heptanone	NGS	88	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181005823			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5181005823			166-42-6	4-Methyl-2-Pentanone	NGS	89	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181005823			158-10-1	4-Methyl-2-Pentanone	NGS	96	<1.8	4.4	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181005823			87-84-1	Acetone	NGS	81	<4.3	49	n/a	n/a	n/a	n/a	4.3	n/a	n/a
5181005823			75-05-5	Acetonitrile	NGS	81	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181005823			98-86-2	Acetophenone	NGS	88	<2.8	3.1	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181005823			105-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181005823			107-18-4	Methyl Alcohol	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5181005823			107-09-1	Methyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
 G - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - (L) Outside Range
 MA - Not Analyzed, MD - Not Detected
 a - (C) Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160667
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-C
 Customer Sample ID: 16-08766-2-IN-C

Sample #	SI	MI	Cell #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cal Err %	Qual Flags
VAPOR-TDU/VQA (B)															
5187005023			71-43-2	Benzene	ug/L	95	<1.2	2.4	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5187005023			100-47-0	Benzonitrile	ug/L	86	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			123-72-8	Butanal	ug/L	100	<2.1	4.8	n/a	n/a	n/a	n/a	n/a	2.1	n/a
5187005023			100-74-0	Butanenitrile	ug/L	97	<1.2	1.7	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5187005023			56-23-5	Carbon tetrachloride	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			108-90-7	Chlorobenzene	ug/L	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			75-00-3	Chloroethane	ug/L	87	<1.8	<1.9	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			97-86-3	Chloroform	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			110-82-7	Cyclohexane	ug/L	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			124-18-5	Decane	ug/L	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5187005023			84-17-5	Ethanol	ug/L	100	<7.4	140	n/a	n/a	n/a	n/a	n/a	7.4	n/a
5187005023			141-78-6	Ethyl acetate	ug/L	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			100-41-4	Ethylbenzene	ug/L	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			115-00-8	Furan	ug/L	86	<1.8	7.5	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			150-84-3	Hexane	ug/L	85	<1.7	21	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5187005023			828-73-9	Heptanenitrile	ug/L	91	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			126-95-7	Methacrylonitrile	ug/L	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			75-08-2	Methylene Chloride	ug/L	95	<2.7	5.2	n/a	n/a	n/a	n/a	n/a	2.7	n/a
5187005023			91-20-3	Naphthalene	ug/L	88	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
5187005023			99-99-3	Nitrobenzene	ug/L	85	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5187005023			110-89-8	Permethrin	ug/L	86	<1.8	5.1	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			107-12-0	Propenenitrile	ug/L	95	<1.4	2.2	n/a	n/a	n/a	n/a	n/a	1.4	n/a
5187005023			110-85-1	Pyridine	ug/L	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
5187005023			100-42-5	Styrene	ug/L	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			127-18-4	Tetrachloroethene	ug/L	98	<1.8	7.0	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187005023			108-88-3	Toluene	ug/L	85	<1.5	2.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			79-07-6	Trichloroethene	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187005023			75-89-4	Trichlorofluoromethane	ug/L	83	<1.8	19	n/a	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 NA = Not Analyzed, ND = Not Detected
 B - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SDO Number:
 Customer Sample ID: 16-08766-2-IN-C
 Customer Sample ID: 16-08766-2-IN-C

Sample #	R	M	MS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Col Eff %	Qual Flags
VAPOR-TOU/VDA_02															
2161030023			16061-01-5	cis-1,3-Dichloropropene	ng/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
2161030023			123-88-4	n-Butyl acetate	ng/g	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2161030023			143-83-5	n-Hexane	ng/g	84	<1.4	17	n/a	n/a	n/a	n/a	1.4	n/a	U
2161030023			16061-02-6	trans-1,3-Dichloropropene	ng/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U

J - Estimated
 G - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LUB Outside Range
 NA - Not Analyzed, ND - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-0
 Customer Sample ID: 16-08766-2-IN-0

Sample #	AI	MS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Con Err %	Qual Flags
VAPOR-TOU (VGA) (E)															
5187000024			79-34-3	1,1,2,2-Tetrachloroethane	MG/G	85	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
5187000024			79-00-5	1,1,2-Trichloroethane	MG/G	86	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5187000024			79-34-3	1,1-Dichloroethane	MG/G	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5187000024			79-35-4	1,2-Dichloroethane	MG/G	87	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
5187000024			101-56-2	1,3-Dichloroethane	MG/G	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5187000024			843-79-8	1,3-Dichloropropane (Total)	MG/G	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5187000024			106-46-7	1,4-Dichlorobenzene	MG/G	86	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a,U
5187000024			123-91-1	1,4-Dioxane	MG/G	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5187000024			71-86-3	1-Butanol	MG/G	140	<8.9	340	n/a	n/a	n/a	n/a	n/a	8.9	n/a,S
5187000024			111-75-6	1-Heptanol	MG/G	87	<3.6	<3.6	n/a	n/a	n/a	n/a	n/a	3.6	n/a,U
5187000024			71-23-8	1-Propanol	MG/G	100	<3.0	40	n/a	n/a	n/a	n/a	n/a	3.0	n/a
5187000024			508-47-4	3,4-Dimethylpyridine	MG/G	94	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a,U
5187000024			1706-29-8	3,5-Dibutylbenzene	MG/G	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
5187000024			78-83-3	3-Butanone	MG/G	94	<1.9	7.0	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
5187000024			110-43-0	3-Heptanone	MG/G	89	<1.6	2.4	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5187000024			591-78-6	3-Hexanone	MG/G	86	<1.2	1.5	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5187000024			234-22-6	3-Methylfuran	MG/G	91	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
5187000024			79-84-4	3-Ethyl-2-one	MG/G	89	<1.7	2.4	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5187000024			106-35-4	3-Heptanone	MG/G	88	<1.5	1.8	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5187000024			106-68-3	3-Octanone	MG/G	87	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
5187000024			105-42-0	4-Methyl-2-hexanone	MG/G	85	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
5187000024			105-19-1	4-Methyl-2-pentanone	MG/G	86	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
5187000024			87-44-1	Acetone	MG/G	81	<4.3	56	n/a	n/a	n/a	n/a	n/a	4.3	n/a
5187000024			79-09-6	Acetonitrile	MG/G	81	<1.8	280	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000024			96-86-2	Acetophenone	MG/G	89	<2.6	3.3	n/a	n/a	n/a	n/a	n/a	2.6	n/a,U
5187000024			107-13-1	Acrylonitrile	MG/G	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5187000024			107-18-6	Allyl Alcohol	MG/G	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
5187000024			107-05-1	Allyl Chloride	MG/G	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U

J - Estimated
 Q - Quantitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 a - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160967
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-0
 Customer Sample ID: 16-08766-2-IN-0

Sample #	RI	MF	Cal #	Analyte	Unit	STD %	Blank	Reagent	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU/VQA 02															
5167006024	71-43-2			Benzene	ug/5	95	<1.3	2.5	n/a	n/a	n/a	n/a	n/a	1.2	n/a,J
5167006024	100-47-0			Benzonitrile	ug/5	86	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5167006024	123-72-8			Butanal	ug/5	100	<2.1	3.8	n/a	n/a	n/a	n/a	n/a	2.1	n/a,J
5167006024	166-14-9			Butanenitrile	ug/5	97	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5167006024	56-23-5			Carbon tetrachloride	ug/5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5167006024	108-90-7			Chlorobenzene	ug/5	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	75-00-3			Chloroethane	ug/5	97	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5167006024	97-86-3			Chloroform	ug/5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	115-83-7			Cyclohexane	ug/5	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5167006024	124-18-5			Decane	ug/5	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
5167006024	84-12-6			Ethanol	ug/5	100	<7.4	200	n/a	n/a	n/a	n/a	n/a	7.4	n/a
5167006024	141-78-6			Ethyl acetate	ug/5	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	100-41-4			Ethylbenzene	ug/5	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	110-02-8			Furan	ug/5	86	<1.6	4.2	n/a	n/a	n/a	n/a	n/a	1.6	n/a,J
5167006024	110-54-3			Hexane	ug/5	85	<1.7	19	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5167006024	828-73-9			Heptanenitrile	ug/5	91	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	126-85-7			Methacrylonitrile	ug/5	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5167006024	75-09-2			Methylene Chloride	ug/5	95	<2.7	4.0	n/a	n/a	n/a	n/a	n/a	2.7	n/a,U
5167006024	91-26-3			Naphthalene	ug/5	84	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a,U
5167006024	98-85-3			Nitrobenzene	ug/5	95	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a,U
5167006024	110-89-8			Permethrin	ug/5	95	<1.6	2.4	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5167006024	507-12-0			Propenenitrile	ug/5	100	<3.8	4.7	n/a	n/a	n/a	n/a	n/a	3.8	n/a,U
5167006024	110-85-1			Pyridine	ug/5	94	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
5167006024	100-42-5			Styrene	ug/5	98	<1.8	12	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5167006024	127-18-4			Tetrachloroethene	ug/5	98	<1.5	3.4	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	108-85-3			Toluene	ug/5	85	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	79-47-6			Trichloroethene	ug/5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5167006024	75-89-4			Trichlorofluoromethane	ug/5	93	<1.6	12	n/a	n/a	n/a	n/a	n/a	1.6	n/a

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 NA - Not Analyzed, MD - Not Detected
 n - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-D
 Customer Sample ID: 16-08766-2-IN-D

Sample	R	AF	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU/VOA IQ															
2167035324			10061-01-5	cis-1,3-Dichloropentane	ug/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
2167035324			123-05-4	n-Butyl acetate	ug/g	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2167035324			143-03-9	n-Heptane	ug/g	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	U
2167035324			10061-02-6	trans-1,3-Dichloropentane	ug/g	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 NA = Not Analyzed, MD = Not Detected
 a - ECS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDC Number:
 Customer Sample ID: 16-057166-2-IN-E
 Customer Sample ID: 16-057166-2-IN-E

Sample#	SI	AM	CAS #	Analyte	Unit	RTS %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc % Qual Flag
VAPORS-TDU VOA-IE														
51617000025			79-34-5	1,1,2,2-Tetrachloroethane	MG5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
51617000025			79-00-5	1,1,2-Trichloroethane	MG5	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a,U
51617000025			75-34-3	1,1-Dichloroethane	MG5	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
51617000025			75-35-4	1,1-Dichloroethene	MG5	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
51617000025			507-56-2	1,3-Dichloroethane	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
51617000025			540-79-6	1,3-Dichloropropene (Total)	MG5	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a,U
51617000025			506-66-7	1,4-Dichlorobenzene	MG5	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a,U
51617000025			523-81-1	1,4-Dioxane	MG5	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a,U
51617000025			71-36-3	1-Butanol	MG5	140	<8.9	309	n/a	n/a	n/a	n/a	8.9	n/a,n
51617000025			111-79-8	1-Heptanol	MG5	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a,U
51617000025			71-23-8	1-Propanol	MG5	120	<3.0	38	n/a	n/a	n/a	n/a	3.0	n/a,U
51617000025			108-87-4	3,4-Dimethylpyridine	MG5	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a,U
51617000025			1708-29-8	2,5-Dihydrofuran	MG5	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
51617000025			78-83-3	2-Butanone	MG5	94	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a,U
51617000025			110-43-0	2-Heptanone	MG5	85	<1.8	2.1	n/a	n/a	n/a	n/a	1.8	n/a,U
51617000025			591-78-8	2-Heptanone	MG5	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a,U
51617000025			534-23-3	2-Methylfuran	MG5	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a,U
51617000025			78-94-4	3-Dimethyl-2-one	MG5	89	<1.7	2.5	n/a	n/a	n/a	n/a	1.7	n/a,U
51617000025			106-36-4	3-Heptanone	MG5	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a,U
51617000025			106-68-3	3-Octanone	MG5	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a,U
51617000025			106-42-0	4-Methyl-2-Pentanone	MG5	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
51617000025			106-10-1	4-Methyl-2-Pentanone	MG5	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a,U
51617000025			87-44-1	Acetone	MG5	81	<4.3	94	n/a	n/a	n/a	n/a	4.3	n/a
51617000025			75-05-8	Acetonitrile	MG5	81	<1.8	160	n/a	n/a	n/a	n/a	1.8	n/a
51617000025			98-88-2	Acetophenone	MG5	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
51617000025			105-13-1	Acrylonitrile	MG5	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a,U
51617000025			107-18-4	Methyl Alcohol	MG5	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a,U
51617000025			107-09-1	Methyl Chloride	MG5	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLB Outside Range
 H - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 2016J067
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-E
 Customer Sample ID: 16-08766-3-IN-E

Sample #	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Br %	Qual Flag
VAPOR-TOU VDA IS															
2181005025			71-43-2	Benzene	ug/g	90	<1.9	3.2	n/a	n/a	n/a	n/a	1.2	n/a	J
2181005025			100-47-0	Benzonitrile	ug/g	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.6	n/a	J
2181005025			123-73-8	Bulonal	ug/g	100	<2.1	4.1	n/a	n/a	n/a	n/a	2.1	n/a	J
2181005025			109-74-0	Bulwerite	ug/g	97	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
2181005025			56-23-5	Carbon tetrachloride	ug/g	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.6	n/a	J
2181005025			108-90-7	Chlorobenzene	ug/g	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
2181005025			75-00-3	Chloroethane	ug/g	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
2181005025			87-86-3	Chloroform	ug/g	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
2181005025			119-83-7	Cyclohexane	ug/g	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			124-18-5	Decane	ug/g	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
2181005025			84-17-9	Diethyl ether	ug/g	100	<1.4	1.9	n/a	n/a	n/a	n/a	2.4	n/a	J
2181005025			141-78-6	Ethyl acetate	ug/g	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
2181005025			100-41-4	Ethylbenzene	ug/g	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
2181005025			110-00-9	Furan	ug/g	86	<1.8	4.0	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			110-54-3	Hexane	ug/g	90	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a	J
2181005025			838-73-9	Heptamethilene	ug/g	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
2181005025			126-69-7	Methacrylonitrile	ug/g	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			75-08-2	Methylene Chloride	ug/g	90	<2.7	3.1	n/a	n/a	n/a	n/a	2.7	n/a	J
2181005025			91-20-3	Naphthalene	ug/g	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	J
2181005025			98-86-3	Nitrobenzene	ug/g	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
2181005025			110-69-8	Pentamethilene	ug/g	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			107-13-0	Propanethiol	ug/g	95	<1.8	2.4	n/a	n/a	n/a	n/a	1.4	n/a	J
2181005025			110-86-1	Pyridine	ug/g	100	<3.8	3.8	n/a	n/a	n/a	n/a	3.8	n/a	J
2181005025			100-42-0	Styrene	ug/g	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			127-18-4	Tetrahydrofuran	ug/g	96	<1.8	3.6	n/a	n/a	n/a	n/a	1.8	n/a	J
2181005025			106-88-3	Toluene	ug/g	90	<1.9	2.3	n/a	n/a	n/a	n/a	1.9	n/a	J
2181005025			79-01-6	Trichloroethene	ug/g	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
2181005025			75-68-4	Trifluoromethane	ug/g	90	<1.8	8.1	n/a	n/a	n/a	n/a	1.8	n/a	J

J - Estimated
 Q - Qualifier
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 a - LCS Outside Range
 MA - Not Analyzed, MD - Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SOG Number:
 Customer Sample ID: 16-08766-2-IN-E
 Customer Sample ID: 16-08766-2-IN-E

Sample	ID	AM	Case #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc In %	Qual Flag
MAPQ6: FID/VQA IE															
S167035525			10061-01-5	cis-1,3-Dichloropropene	MOG	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S167035525			10061-02-4	n-Butyl acetate	MOG	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S167035525			143-63-9	n-Heptane	MOG	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S167035525			10061-03-6	trans-1,3-Dichloropropene	MOG	116	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a

J - Estimated
 G - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 MA - Not Analyzed, ND - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-F
 Customer Sample ID: 16-08766-2-IN-F

Sample	B	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Ret %	Det Limit	Col Br %	Qual Flags
VARIABLE VOLUME															
2187020526			75-34-5	1,1,2,2-Tetrachloroethane	MOG	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020526			78-00-5	1,1,2,2-Tetrachloroethane	MOG	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187020526			75-34-3	1,1-Dichloroethane	MOG	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020526			75-35-4	1,1-Dichloroethane	MOG	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187020526			102-66-2	1,2-Dichloroethane	MOG	102	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020526			243-75-8	1,3-Dichloropropane (Total)	MOG	89	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
2187020526			106-46-7	1,4-Dichlorobenzene	MOG	102	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020526			123-91-1	1,4-Dioxane	MOG	140	<8.9	300	n/a	n/a	n/a	n/a	8.9	n/a	n/a
2187020526			71-36-3	1-Ethanol	MOG	87	<0.8	<0.8	n/a	n/a	n/a	n/a	0.8	n/a	n/a
2187020526			111-70-8	1-Heptanol	MOG	102	<0.8	41	n/a	n/a	n/a	n/a	0.8	n/a	n/a
2187020526			71-23-8	1-Propanol	MOG	94	<0.3	<0.3	n/a	n/a	n/a	n/a	0.3	n/a	n/a
2187020526			108-47-4	2,4-Dimethylpyridine	MOG	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187020526			1758-29-8	2,5-Dihydrofuran	MOG	94	<1.9	6.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020526			78-03-3	2-Butanone	MOG	86	<1.8	2.3	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020526			115-43-0	2-Heptanone	MOG	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020526			597-78-8	2-Heptanone	MOG	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020526			234-23-0	2-Methylfuran	MOG	89	<1.7	2.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020526			78-04-4	3-Buten-2-one	MOG	88	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187020526			106-36-4	3-Heptanone	MOG	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2187020526			106-68-3	3-Octanone	MOG	89	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187020526			105-42-0	4-Methyl-2-hexanone	MOG	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020526			108-10-1	4-Methyl-2-Pentanone	MOG	81	<4.3	4.3	n/a	n/a	n/a	n/a	4.3	n/a	n/a
2187020526			87-64-1	Acetone	MOG	81	<1.8	3.1	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020526			75-05-8	Acetonitrile	MOG	88	<2.8	3.0	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187020526			58-86-2	Acetophenone	MOG	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020526			105-13-1	Acrylonitrile	MOG	102	<0.9	<0.9	n/a	n/a	n/a	n/a	0.9	n/a	n/a
2187020526			107-18-8	Allyl Alcohol	MOG	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187020526			107-05-1	Allyl Chloride	MOG	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
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 L - LLS Outside Range
 MA - Not Analyzed, MD - Not Detected
 a - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SOG Number:
 Customer Sample ID: 16-08766-2-IN-F
 Customer Sample ID: 16-08766-2-IN-F

Sample	R	M	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spa Rec %	Det Limit	Col Eff %	Qual Flag
VAPOR-TOU VOA 16															
2187030626			71-43-2	Benzene	ugOS	95	<1.2	2.8	n/a	n/a	n/a	n/a	1.2	n/a	JD
2187030626			100-47-0	Benzonitrile	ugOS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.8	n/a	JJ
2187030626			123-73-8	Bufoal	ugOS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	OU
2187030626			109-74-0	Butanediol	ugOS	97	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	JD
2187030626			66-23-5	Carbon tetrachloride	ugOS	115	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	OU
2187030626			108-90-7	Chlorobenzene	ugOS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			75-00-3	Chloroethane	ugOS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	OU
2187030626			87-86-3	Chloroform	ugOS	115	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			110-82-7	Cyclohexane	ugOS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	OU
2187030626			124-18-5	Decane	ugOS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	JJ
2187030626			84-17-0	Ethanol	ugOS	100	<1.4	1.9	n/a	n/a	n/a	n/a	1.4	n/a	JD
2187030626			141-78-6	Ethyl acetate	ugOS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			100-47-4	Styrene	ugOS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			110-02-9	Furan	ugOS	86	<1.6	3.4	n/a	n/a	n/a	n/a	1.6	n/a	JD
2187030626			110-64-3	Hexane	ugOS	85	<1.7	1.8	n/a	n/a	n/a	n/a	1.7	n/a	JD
2187030626			828-73-9	Heptanediol	ugOS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			126-68-7	Methacrylonitrile	ugOS	87	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	OU
2187030626			74-99-2	Methylene Chloride	ugOS	95	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	n/a	JD
2187030626			81-20-3	Naphthalene	ugOS	86	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	JJ
2187030626			68-95-3	Nitrobenzene	ugOS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	JJ
2187030626			110-69-8	Permethrin	ugOS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	OU
2187030626			107-12-0	Propene	ugOS	95	<1.4	2.1	n/a	n/a	n/a	n/a	1.4	n/a	JD
2187030626			110-86-1	Pyridine	ugOS	100	<3.8	4.9	n/a	n/a	n/a	n/a	3.8	n/a	JD
2187030626			100-42-5	Styrene	ugOS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	OU
2187030626			127-18-4	Tetrachloroethane	ugOS	99	<1.6	3.2	n/a	n/a	n/a	n/a	1.6	n/a	JD
2187030626			106-88-3	Toluene	ugOS	85	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	JD
2187030626			74-01-6	Trichloroethane	ugOS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	OU
2187030626			71-69-4	Trichloroethylene	ugOS	93	<1.8	1.1	n/a	n/a	n/a	n/a	1.8	n/a	JD

J - Estimated
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 L - LLS Outside Range
 a - LCS Outside Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162067
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-F
 Customer Sample ID: 16-08766-2-IN-F

Sample	R	M	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Car Err %	Qual Flags
VAPOR-110U VQA 10															
S187026528			N0081-01-5	cis-1,3-Dichloropropene	ND5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	OU
S187026528			133-86-4	n-Butyl acetate	ND5	14	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	OU
S187026528			143-83-3	n-Heptane	ND5	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	OU
S187026528			N0081-02-6	trans-1,3-Dichloropropene	ND5	116	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	OU

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 L - LLS Outside Range
 S - LCS Outside Range
 MA - Not Analyzed, ND - Not Detected
 S - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161067
 SDG Number:
 Customer Sample ID: 16-05786-2-IN-G
 Customer Sample ID: 16-05786-2-IN-G

Sample	R	AM	CAS #	Analyte	Unit	ESD %	Blank	Result	Duplicate	Average	RPD %	Spa Res %	Set Limit	Col Lin %	Qual Flags
VMPQR: TDU VQA BE															
21617035527			79-34-5	1,1,2,2-Tetrachloroethane	MG5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
21617035527			79-50-5	1,1,2-Trichloroethane	MG5	98	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
21617035527			79-34-3	1,1-Dichloroethane	MG5	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
21617035527			79-38-4	1,1-Dichloroethene	MG5	87	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
21617035527			107-66-2	1,3-Dichloroethane	MG5	116	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
21617035527			343-79-6	1,3-Dichloropropene (Total)	MG5	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
21617035527			108-66-7	1,4-Dichlorobenzene	MG5	98	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a,U
21617035527			123-81-1	1,4-Dioxane	MG5	105	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
21617035527			71-36-3	1-Hexanol	MG5	140	<6.9	390	n/a	n/a	n/a	n/a	n/a	6.9	n/a,U
21617035527			111-70-6	1-Heptanol	MG5	87	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a,U
21617035527			71-23-8	1-Propanol	MG5	120	<3.0	38	n/a	n/a	n/a	n/a	n/a	3.0	n/a,U
21617035527			108-41-4	2,4-Dimethylpyridine	MG5	94	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a,U
21617035527			1708-29-8	2,5-Dihydrofuran	MG5	99	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
21617035527			78-93-3	2-Butanone	MG5	94	<1.9	7.6	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
21617035527			110-43-6	2-Heptanone	MG5	86	<1.6	1.8	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
21617035527			591-78-6	2-Nonanone	MG5	85	<1.2	1.6	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
21617035527			534-22-5	2-Methylfuran	MG5	91	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
21617035527			79-84-4	2-Buten-2-one	MG5	89	<1.7	2.1	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
21617035527			108-35-4	2-Heptanone	MG5	88	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
21617035527			109-68-3	2-Octanone	MG5	87	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
21617035527			105-42-6	4-Methyl-2-pentanone	MG5	85	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
21617035527			109-10-1	4-Methyl-2-pentanone	MG5	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
21617035527			87-64-1	Acetone	MG5	81	<4.3	58	n/a	n/a	n/a	n/a	n/a	4.3	n/a
21617035527			79-06-8	Acetonitrile	MG5	81	<1.8	120	n/a	n/a	n/a	n/a	n/a	1.8	n/a
21617035527			96-86-2	Acetophenone	MG5	88	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a,U
21617035527			100-13-1	Acrylonitrile	MG5	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
21617035527			100-18-6	Allyl Alcohol	MG5	116	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
21617035527			101-09-1	Allyl Chloride	MG5	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20161067
 SDC Number:
 Customer Sample ID: 16-08766-3-IN-G
 Customer Sample ID: 16-08766-3-IN-G

Sample	ID	Alt	Cal	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	SDS %	Ign Res %	Det Limit	Det Err %	Qual Flags
VIA-Q8: TDU VOA 82															
S161030527	71-43-2			Benzene	NGS	92	<1.2	3.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S161030527	100-47-0			Benzonitrile	NGS	88	<1.0	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S161030527	120-72-6			Butanol	NGS	100	<2.1	2.7	n/a	n/a	n/a	n/a	2.1	n/a	J
S161030527	109-74-0			Butanetriole	NGS	97	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
S161030527	54-23-5			Carbon tetrachloride	NGS	110	<1.0	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S161030527	108-90-7			Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	78-09-3			Chloroethane	NGS	87	<1.0	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S161030527	87-86-3			Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	110-82-7			Cyclohexane	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S161030527	124-98-5			Decane	NGS	79	<2.0	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S161030527	84-17-0			Ethanol	NGS	100	<7.4	24.0	n/a	n/a	n/a	n/a	7.4	n/a	J
S161030527	141-79-6			Ethyl acetate	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	100-41-4			Ethylbenzene	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	110-69-9			Furan	NGS	86	<1.0	3.2	n/a	n/a	n/a	n/a	1.0	n/a	J
S161030527	110-64-3			Heptane	NGS	80	<1.7	1.6	n/a	n/a	n/a	n/a	1.7	n/a	J
S161030527	828-73-9			Hexamethyl	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	126-84-7			Methacrylonitrile	NGS	97	<1.0	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S161030527	78-09-2			Methylene Chloride	NGS	90	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	n/a	J
S161030527	81-20-3			Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	J
S161030527	84-95-3			Nitrobenzene	NGS	89	<2.0	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S161030527	110-09-6			Permethrin	NGS	95	<1.0	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S161030527	101-02-0			Propenitrile	NGS	95	<3.8	4.9	n/a	n/a	n/a	n/a	3.8	n/a	J
S161030527	110-88-1			Pyridine	NGS	130	<3.8	4.9	n/a	n/a	n/a	n/a	3.8	n/a	J
S161030527	100-42-5			Styrene	NGS	94	<1.0	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S161030527	121-58-4			Tetrahydrofuran	NGS	95	<1.0	2.5	n/a	n/a	n/a	n/a	1.0	n/a	J
S161030527	108-88-3			Toluene	NGS	80	<1.5	2.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	78-07-8			Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S161030527	78-09-4			Trichlorofluoromethane	NGS	93	<1.0	1.0	n/a	n/a	n/a	n/a	1.0	n/a	J

J - Estimated
 Q - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 I - ILS Outside Range
 NA = Not Analyzed, ND = Not Detected
 # - LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163067
 SDC Number:
 Customer Sample ID: 16-08766-2-IN-G
 Customer Sample ID: 16-08766-2-IN-G

Sample #	IN	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Std Limit	Cal Br %	Qual Flags
VAPOR-TOU-VQA (E)															
2187030327			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
2187030327			123-66-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2187030327			143-63-5	n-Heptane	NGS	84	<1.4	15	n/a	n/a	n/a	n/a	1.4		n/a
2187030327			10061-02-6	trans-1,3-Dichloropropene	NGS	116	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U

J - Estimated
 G - Qualitative
 U - Less Than Detection Limit
 E - Outside Calibration Range
 L - LLS Outside Range
 H - HHS Outside Range
 NA = Not Analyzed, ND = Not Detected
 # - LCS Outside Range

April 2017
12/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160306
 SDG Number:
 Customer Sample ID: 16-08765-3-BASE-EFF
 Customer Sample ID: 16-08765-3-BASE-EFF

Sample #	AI	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Con Fir %	Qual Flag
16170305007		78-34-5	1,1,2,2-Tetrachloroethane	ng/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
16170305007		78-34-5	1,1,2,2-Tetrachloroethane	ng/g	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
16170305007		78-34-3	1,1-Dichloroethane	ng/g	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
16170305007		78-34-4	1,1-Dichloroethane	ng/g	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
16170305007		167-06-2	1,2-Dichloroethane	ng/g	192	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
16170305007		943-71-6	1,3-Dichloropropene (Total)	ng/g	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
16170305007		108-46-7	1,4-Dichlorobenzene	ng/g	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
16170305007		733-87-1	1,4-Dioxane	ng/g	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
16170305007		71-38-3	1-Butanol	ng/g	160	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	n/a
16170305007		111-75-6	1-Hexanol	ng/g	91	<8.0	<8.0	n/a	n/a	n/a	n/a	8.0	n/a	n/a
16170305007		71-23-6	1-Propanol	ng/g	100	<3.0	8.6	n/a	n/a	n/a	n/a	3.0	n/a	n/a
16170305007		108-47-4	2,4-Dimethylpyridine	ng/g	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
16170305007		1706-28-8	3,3-Dihydroquinolin	ng/g	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
16170305007		78-93-3	3-Butanone	ng/g	94	<1.9	1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
16170305007		110-43-0	3-Hexanone	ng/g	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
16170305007		201-73-6	3-Heptanone	ng/g	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
16170305007		234-23-5	3-Methylbutan	ng/g	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
16170305007		78-94-4	3-Nonan-2-one	ng/g	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
16170305007		108-30-4	3-Heptanone	ng/g	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
16170305007		108-66-3	3-Octanone	ng/g	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
16170305007		109-43-6	4-Methyl-2-Pentanone	ng/g	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
16170305007		108-10-1	4-Methyl-2-Pentanone	ng/g	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
16170305007		87-64-1	Acetone	ng/g	86	<4.3	21	n/a	n/a	n/a	n/a	4.3	n/a	n/a
16170305007		75-05-8	Acetonitrile	ng/g	84	<7.8	7.8	n/a	n/a	n/a	n/a	7.8	n/a	n/a
16170305007		88-69-2	Acetophenone	ng/g	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
16170305007		165-132-1	Acrylonitrile	ng/g	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
16170305007		107-18-6	Allyl Alcohol	ng/g	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
16170305007		107-02-1	Allyl Chloride	ng/g	86	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a

J = Estimated
 n = LCS Outside Range
 U = Less Than Detection Limit
 G = Qualitative
 B = Blank Contamination
 Y = Comment
 MA = Not Analyzed, ND = Not Detected
 L = LCS Outside Range
 E = Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161004
 SDG Number:
 Customer Sample ID: 16-08765-3-BASE-EFF
 Customer Sample ID: 16-08765-3-BASE-EFF

Sample	ID	Alt	CAS #	Analyte	Unit	SPD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Col Eff %	Qual Flag
VAPOR-TOU VOA 12															
S1617035007			71-43-2	Benzene	ND5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S1617035007			100-47-6	Benzonitrile	ND5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S1617035007			123-72-8	Bulanal	ND5	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S1617035007			109-74-6	Butenitrile	ND5	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S1617035007			54-23-5	Carbon tetrachloride	ND5	105	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S1617035007			108-90-7	Chlorobenzene	ND5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S1617035007			75-00-3	Chloroethane	ND5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S1617035007			87-68-3	Chloroform	ND5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S1617035007			119-85-7	Cyclohexane	ND5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			124-18-5	Dioxane	ND5	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S1617035007			64-17-6	Ethanol	ND5	100	<7.4	11	n/a	n/a	n/a	n/a	7.4	n/a	U
S1617035007			141-78-6	Ethyl acetate	ND5	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S1617035007			100-41-4	Styrene	ND5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S1617035007			119-00-9	Furan	ND5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			119-64-3	Hexane	ND5	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S1617035007			828-73-8	Heptane	ND5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S1617035007			129-68-7	Methacrylonitrile	ND5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			75-09-2	Methylene Chloride	ND5	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S1617035007			81-20-3	Naphthalene	ND5	91	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S1617035007			84-66-3	Nitrobenzene	ND5	82	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S1617035007			119-09-8	Permethrin	ND5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			107-12-0	Propene	ND5	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S1617035007			110-68-1	Pyridine	ND5	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S1617035007			100-42-5	Styrene	ND5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			107-18-4	Tetrahydrofuran	ND5	100	<1.8	28	n/a	n/a	n/a	n/a	1.8	n/a	U
S1617035007			108-88-3	Toluene	ND5	92	<1.9	3.5	n/a	n/a	n/a	n/a	1.9	n/a	U
S1617035007			78-07-6	Trichloroethane	ND5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S1617035007			75-09-4	Trichloroethylene	ND5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U

J - Estimated
 B - Blank Contamination
 U - Less Than Detection Limit
 Y - Comment
 L - LLS Outside Range
 E - Outside Calibration Range
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDC Number:
 Customer Sample ID: 16-08765-3-BASE-EFF
 Customer Sample ID: 16-08765-3-BASE-EFF

Sample	R	MP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Out Limit	Out Err %	Qual Flags
VAPOR-TOU VQA #2															
S187000007			10091-01-3	cis-1,3-Dichloropropene	ug/g	112	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a(n)
S187000007			123-80-4	n-Butyl acetate	ug/g	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a(n)
S187000007			143-85-5	n-Heptane	ug/g	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a(n)
S187000007			10091-02-6	trans-1,3-Dichloropropene	ug/g	112	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a(n)

J - Estimated
 a - LCS Outside Range
 U - Less Than Detection Limit
 G - Qualifier
 B - Blank Contamination
 Y - Comment
 NA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161004
 SDG Number:
 Customer Sample ID: 16-08765-3-BASE-IN
 Customer Sample ID: 16-08765-3-BASE-IN

Sample #	Alt	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Qual Flags
VAPOR: TOU VOA 02													
51817035008	79-34-5		1,1,2,2-Tetrachloroethane	ugOS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/aU
51817035008	79-00-5		1,1,2,2-Tetrachloroethane	ugOS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/aU
51817035008	79-34-3		1,1-Dichloroethane	ugOS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/aU
51817035008	79-30-4		1,1-Dichloroethane	ugOS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/aU
51817035008	107-08-2		1,2-Dichloroethane	ugOS	102	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/aU
51817035008	240-75-0		1,3-Dichloropropene (Total)	ugOS	n/a	n/a	<1.3	n/a	n/a	n/a	n/a	1.2	n/aU
51817035008	109-46-7		1,4-Dichlorobenzene	ugOS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/aU
51817035008	123-87-1		1,4-Dioxane	ugOS	500	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/aU
51817035008	71-36-3		1-Hexanol	ugOS	150	<0.9	28	n/a	n/a	n/a	n/a	0.9	n/aY
51817035008	111-70-6		1-Heptanol	ugOS	78	<0.8	<0.8	n/a	n/a	n/a	n/a	0.8	n/aU
51817035008	71-23-8		1-Propanol	ugOS	110	<0.9	8.3	n/a	n/a	n/a	n/a	0.8	n/aU
51817035008	108-47-4		2,4-Dimethylvaline	ugOS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.0	n/aU
51817035008	3708-29-8		2,5-Dihydrofuran	ugOS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/aU
51817035008	79-93-1		2-Butanone	ugOS	93	<1.9	3.4	n/a	n/a	n/a	n/a	1.9	n/aU
51817035008	110-43-0		2-Heptanone	ugOS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/aU
51817035008	201-78-8		2-Hexanone	ugOS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/aU
51817035008	534-23-5		2-Methylbutane	ugOS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.7	n/aU
51817035008	78-94-4		2-Buten-2-one	ugOS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/aU
51817035008	106-30-4		3-Heptanone	ugOS	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/aU
51817035008	109-66-3		3-Octanone	ugOS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/aU
51817035008	105-42-0		4-Methyl-2-hexanone	ugOS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/aU
51817035008	109-10-1		4-Methyl-2-Pentanone	ugOS	96	<1.8	5.2	n/a	n/a	n/a	n/a	1.9	n/aU
51817035008	87-64-1		Acetone	ugOS	84	<4.3	96	n/a	n/a	n/a	n/a	4.3	n/a
51817035008	75-05-8		Acetonitrile	ugOS	83	<1.8	7.0	n/a	n/a	n/a	n/a	1.8	n/aU
51817035008	88-88-2		Acetophenone	ugOS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/aU
51817035008	107-13-1		Arylonitrile	ugOS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/aU
51817035008	107-88-6		Allyl Alcohol	ugOS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/aU
51817035008	107-05-1		Allyl Chloride	ugOS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/aU

J - Estimated
 B - Blank Contamination
 U - Less Than Detection Limit
 G - Qualitative
 NA = Not Analyzed, MD = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162864
 SDG Number:
 Customer Sample ID: 16-08765-2-BASE-IN
 Customer Sample ID: 16-08765-2-BASE-IN

Sample#	SI	AF	CA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Exp Bias %	Det Limit	Con En %	Qual Flags
21817035008			71-43-2	Benzene	ug/L	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
21817035008			100-47-0	Benzonitrile	ug/L	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21817035008			123-73-8	Buflinal	ug/L	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
21817035008			109-14-0	Bulmetirle	ug/L	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
21817035008			36-23-5	Carbon tetrachloride	ug/L	174	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21817035008			109-90-7	Chlorobenzene	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
21817035008			75-60-3	Chloroethane	ug/L	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21817035008			87-46-3	Chloroform	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
21817035008			110-82-7	Cyclohexane	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21817035008			124-18-5	Decane	ug/L	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
21817035008			84-17-5	Ethanol	ug/L	100	<7.4	20	n/a	n/a	n/a	n/a	7.4	n/a	n/a
21817035008			141-78-6	Ethyl acetate	ug/L	95	<1.9	1.8	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21817035008			100-41-4	Ethylbenzene	ug/L	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
21817035008			119-90-9	Furan	ug/L	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21817035008			119-34-3	Hexane	ug/L	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
21817035008			828-73-9	Heptachlor	ug/L	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
21817035008			126-99-7	Methoxychlor	ug/L	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21817035008			75-09-2	Methylene Chloride	ug/L	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
21817035008			91-20-3	Naphthalene	ug/L	84	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
21817035008			99-99-3	Nitrobenzene	ug/L	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
21817035008			110-99-8	Pentachloride	ug/L	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
21817035008			107-12-0	Propanamide	ug/L	93	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
21817035008			110-88-1	Pyridine	ug/L	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
21817035008			100-42-5	Styrene	ug/L	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
21817035008			127-18-4	Tetrachloroethane	ug/L	100	<1.6	38	n/a	n/a	n/a	n/a	1.6	n/a	n/a
21817035008			106-90-3	Toluene	ug/L	90	<1.5	7.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a
21817035008			75-01-6	Trichloroethane	ug/L	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21817035008			75-69-4	Trichloroethene	ug/L	100	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	n/a	n/a

J - Estimated
 n - LCS Outside Range
 U - Less Than Detection Limit
 Q - Qualifier
 B - Blank Contamination
 Y - Comment
 NA - Not Analyzed, MD - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160066
 SDG Number:
 Customer Sample ID: 16-08765-2-BASE-IN
 Customer Sample ID: 16-08765-3-BASE-IN

Sample#	B	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TOU VQA IE															
2167000008			10061-01-5	1e-1,3-Dichloropentane	Y025	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a J
2167000008			123-86-4	n-Butyl acetate	Y025	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a J
2167000008			143-83-3	n-Hexane	Y025	87	<1.4	2.2	n/a	n/a	n/a	n/a	1.4		n/a J
2167000008			10061-02-6	trans-1,3-Dichloropentane	Y025	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a J

J - Estimated
 a - LCS Outside Range

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 Q - Qualifying

B - Blank Contamination
 Y - Comment

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 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603066
 SDG Number:
 Customer Sample ID: 16-08765-2-BLANK1
 Customer Sample ID: 16-08765-2-BLANK1

Sample#	R	M	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Ret Limit	Cartridge Status
VAPOR-TOU/VQA ID														
5161030509			75-34-5	1,1,2,2-Tetrachloroethane	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a/U
5161030509			75-00-5	1,1,2-Trichloroethane	NGS	86	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a/U
5161030509			75-34-3	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a/U
5161030509			75-35-4	1,2-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a/U
5161030509			107-06-2	1,3-Dichloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
5161030509			543-73-6	1,3-Dibromoisoprene (Total)	NGS	86	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a/U
5161030509			166-46-7	1,4-Dichlorobenzene	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
5161030509			123-91-1	1,4-Dioxane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
5161030509			71-36-3	1-Butanol	NGS	140	<8.9	32	n/a	n/a	n/a	n/a	8.9	n/a/De
5161030509			111-75-8	1-Heptanol	NGS	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a/U
5161030509			71-23-8	1-Propanol	NGS	100	<3.9	39	n/a	n/a	n/a	n/a	3.9	n/a
5161030509			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a/U
5161030509			1768-20-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
5161030509			75-82-3	3-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a/U
5161030509			110-43-6	3-Heptanone	NGS	88	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
5161030509			201-78-6	3-Nonanone	NGS	85	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a/U
5161030509			534-22-6	3-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a/U
5161030509			75-84-4	3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
5161030509			108-35-4	3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a/U
5161030509			108-69-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a/U
5161030509			109-42-6	4-Methyl-2-pentanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a/U
5161030509			108-10-1	4-Methyl-2-pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a/U
5161030509			83-84-1	Acetone	NGS	81	<4.3	32	n/a	n/a	n/a	n/a	4.3	n/a
5161030509			75-05-6	Acetonitrile	NGS	81	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a
5161030509			98-82-2	Acetophenone	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
5161030509			107-13-1	Anisole	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
5161030509			149-18-6	Methyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a/U
5161030509			107-09-1	Methyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U

J - Estimated
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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162066
 SDG Number:
 Customer Sample ID: 16-08765-2-BLANK1
 Customer Sample ID: 16-08765-2-BLANK1

Sample#	R	AW	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Con Err %	Qual Flags
VAPOR-TOU/VOA 82															
5161000009			71-43-3	Benzene	ug/L	95	<1.3	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5161000009			100-47-0	Benzonitrile	ug/L	85	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161000009			123-72-8	Butanol	ug/L	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
5161000009			109-74-9	Butanenitrile	ug/L	97	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5161000009			96-23-3	Carbon tetrachloride	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			108-90-7	Chlorobenzene	ug/L	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161000009			75-00-3	Chloroethane	ug/L	97	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161000009			97-86-3	Chloroform	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161000009			150-82-7	Cyclohexane	ug/L	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			124-18-5	Decane	ug/L	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5161000009			84-17-5	Ethanol	ug/L	100	<0.4	17	n/a	n/a	n/a	n/a	n/a	7.4	n/a
5161000009			54-1-78-6	Ethyl acetate	ug/L	81	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161000009			100-41-4	Ethylbenzene	ug/L	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			119-03-9	Furan	ug/L	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			110-54-3	Hexane	ug/L	85	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161000009			828-73-9	Hexanenitrile	ug/L	91	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161000009			238-89-7	Methoxybenzene	ug/L	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			75-09-2	Methylene Chloride	ug/L	95	<2.7	3.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a
5161000009			91-20-3	Naphthalene	ug/L	88	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
5161000009			99-99-3	Nitrobenzene	ug/L	95	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a
5161000009			110-59-8	Permethrin	ug/L	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			107-13-6	Propene	ug/L	95	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a
5161000009			119-85-1	Pyridine	ug/L	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
5161000009			100-42-5	Styrene	ug/L	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			127-18-4	Tetrachloroethene	ug/L	99	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161000009			108-88-3	Toluene	ug/L	85	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161000009			79-01-6	Trichloroethene	ug/L	110	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161000009			75-09-4	Trichlorofluoromethane	ug/L	83	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 B - Blank Contamination
 U - Less Than Detection Limit
 Y - Comment
 MA - Not Analyzed, MD - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDO Number:
 Customer Sample ID: 16-08765-2-BLANK1
 Customer Sample ID: 16-08765-2-BLANK1

Sample #	MF	Car #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Std Res %	Std Limit	Col Err %	Qual Flags
VAPOR: TOLUENE, BZ														
161030608		10061-01-5	tol-1,3-Dichloropentane	%CS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
161030609		123-86-4	n-Butyl acetate	%CS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
161030609		142-93-5	n-Heptane	%CS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
161030608		10061-02-6	trans-1,3-Dichloropentane	%CS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
 a - UCL Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
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 Y - Comment
 MA - Not Analyzed, ND - Not Detected
 L - LCL Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603064
 SDO Number:
 Customer Sample ID: 16-08765-2-BLANK2
 Customer Sample ID: 16-08765-2-BLANK2

Sample #	AI	MS	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPO %	Rph Rec %	Ret Limit	Cal Err %	Qual Flags
VAPOR:TDU/VQA:02															
161000010			75-34-5	1,1,2,2-Tetrachloroethane	NG05	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
161000010			75-00-5	1,1,2-Trichloroethane	NG05	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
161000010			75-34-3	1,1-Dichloroethane	NG05	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
161000010			75-35-4	1,2-Dichloroethane	NG05	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
161000010			107-06-2	1,2-Dichloroethane	NG05	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
161000010			543-75-6	1,3-Dichloropropane (Total)	NG05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.2	n/a	n/a
161000010			506-46-7	1,4-Dichlorobenzene	NG05	95	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
161000010			523-81-1	1,4-Dioxane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
161000010			71-36-3	1-Butanol	NG05	140	<8.9	17	n/a	n/a	n/a	n/a	8.9	n/a	n/a
161000010			111-70-8	1-Heptanol	NG05	87	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
161000010			71-23-8	1-Propanol	NG05	120	<3.6	30	n/a	n/a	n/a	n/a	3.0	n/a	n/a
161000010			108-87-4	2,4-Dimethylpyridine	NG05	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
161000010			1768-209-8	2,5-Dihydrofuran	NG05	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
161000010			78-83-3	2-Butanone	NG05	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
161000010			119-43-0	2-Heptanone	NG05	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
161000010			501-76-6	2-Heptanone	NG05	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
161000010			534-33-0	2-Methylfuran	NG05	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
161000010			78-84-4	2-Butan-2-one	NG05	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
161000010			106-35-4	2-Heptanone	NG05	84	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
161000010			199-89-3	3-Octanone	NG05	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
161000010			169-42-0	4-Methyl-2-hexanone	NG05	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
161000010			108-10-1	4-Methyl-2-pentanone	NG05	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
161000010			87-64-1	Acetone	NG05	81	<4.3	21	n/a	n/a	n/a	n/a	4.3	n/a	n/a
161000010			75-05-8	Acetonitrile	NG05	81	<1.8	810	n/a	n/a	n/a	n/a	1.8	n/a	n/a
161000010			98-88-2	Acetophenone	NG05	85	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
161000010			507-13-1	Acrylonitrile	NG05	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
161000010			107-18-6	Methyl Alcohol	NG05	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
161000010			107-05-1	Methyl Chloride	NG05	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
 # - LCS Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 NA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160306
 SDG Number:
 Customer Sample ID: 16-08765-2-BLANK2
 Customer Sample ID: 16-08765-2-BLANK2

Sample #	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Cal Br Sys Qual Flag
VAPOR-TDU VOA 16													
161000010	71-43-2		Benzene	MG/L	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
161000010	100-47-0		Benzonitrile	MG/L	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
161000010	123-72-6		Subanal	MG/L	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
161000010	109-74-0		Subaricic	MG/L	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
161000010	56-23-5		Carbon tetrachloride	MG/L	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
161000010	108-90-7		Chlorobenzene	MG/L	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	75-05-3		Chloroethane	MG/L	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
161000010	87-86-3		Chlorobrom	MG/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	110-82-7		Cyrtolizane	MG/L	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	124-18-5		Duane	MG/L	79	<2.9	<2.9	n/a	n/a	n/a	n/a	2.9	n/a
161000010	84-17-5		Ethanol	MG/L	100	<7.4	20	n/a	n/a	n/a	n/a	7.4	n/a
161000010	141-78-6		Ethyl acetate	MG/L	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	100-41-4		Ethylbenzene	MG/L	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	116-20-8		Furan	MG/L	86	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	118-94-3		Hexane	MG/L	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
161000010	508-73-8		Hexamethyl	MG/L	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	128-08-7		Methacrylonitrile	MG/L	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	75-09-2		Methylene Chloride	MG/L	90	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
161000010	91-20-3		Naphthalene	MG/L	86	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
161000010	98-09-3		Nitrobenzene	MG/L	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
161000010	119-99-4		Permethrin	MG/L	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	107-13-0		Propylene	MG/L	90	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
161000010	119-86-1		Pyridine	MG/L	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
161000010	100-42-5		Styrene	MG/L	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	127-18-4		Tetrachloroethane	MG/L	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
161000010	108-88-3		Toluene	MG/L	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	79-07-6		Trichloroethane	MG/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
161000010	75-08-4		Trichlorofluoromethane	MG/L	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 # - LCS Outside Range
 U - Less Than Detection Limit
 G - Qualitative
 B - Blank Contamination
 Y - Comment
 MA - Not Analyzed, MD - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDG Number:
 Customer Sample ID: 16-08765-2-BLANK2
 Customer Sample ID: 16-08765-2-BLANK2

Sample#	SI	AF	Gas #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Ret Limit	Col Str %	Qual Flags
VAPOR-TOU-VOCs 82															
2161020810			10061-01-5	Isa-1,3-Dichloropentane	ug/L	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
2161020810			123-00-4	n-Butyl acetate	ug/L	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2161020810			142-02-5	n-Heptane	ug/L	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2161020810			10061-02-8	trans-1,3-Dichloropentane	ug/L	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
 B - LCL Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 NA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-B
 Customer Sample ID: 16-08765-3-IN-B

Sample#	R	MP	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Em %	Qual Flags
1617030511				1,1,2,2-Tetrachloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,2-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,2-Dichloroethane (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1-Butanol	NGS	130	<8.9	360	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1-Heptanol	NGS	78	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				1-Propanol	NGS	110	<3.0	35	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				2,5-Dihydrofuran	NGS	98	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				2-Butanone	NGS	90	<1.8	5.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				3-Heptanone	NGS	88	<1.8	3.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				2-Hexanone	NGS	86	<1.2	2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				2-Methylfuran	NGS	90	<1.8	<1.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				3-Buten-2-one	NGS	87	<1.7	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				3-Heptanone	NGS	88	<1.5	3.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				4-Methyl-2-Pentanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				4-Methyl-2-Pentanone	NGS	95	<1.9	3.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Acetone	NGS	84	<4.3	38	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Acetonitrile	NGS	90	<1.8	52	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Acetophenone	NGS	91	<2.8	4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Amyl Alcohol	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Methyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1617030511				Methyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160804
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-B
 Customer Sample ID: 16-08765-2-IN-B

Sample #	Q	AF	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Ret %	Std Limit	Cal Err %	Qual Flags
VAPOR-TOU-VOCs 82															
2161000511			71-43-2	Benzene	ug/L	95	<1.2	2.2	n/a	n/a	n/a	n/a	1.2		n/a
2161000511			100-47-0	Benzonitrile	ug/L	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000511			123-73-8	Bulonal	ug/L	110	<2.1	3.9	n/a	n/a	n/a	n/a	2.1		n/a
2161000511			166-14-9	Buloxene	ug/L	95	<1.2	1.5	n/a	n/a	n/a	n/a	1.2		n/a
2161000511			26-23-3	Carbon tetrachloride	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000511			108-90-7	Chlorobenzene	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
2161000511			75-60-3	Chloroethane	ug/L	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000511			87-46-3	Chloroform	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
2161000511			110-83-7	Cyclohexane	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000511			124-18-9	Cyclohexane	ug/L	94	<2.8	3.0	n/a	n/a	n/a	n/a	2.8		n/a
2161000511			84-17-5	Ethanol	ug/L	100	<1.4	2.0	n/a	n/a	n/a	n/a	1.4		n/a
2161000511			54-1-28-6	Ethyl acetate	ug/L	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000511			100-41-4	Ethylbenzene	ug/L	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a
2161000511			110-32-9	Furan	ug/L	91	<1.8	4.3	n/a	n/a	n/a	n/a	1.8		n/a
2161000511			110-34-3	Hexane	ug/L	91	<1.7	1.9	n/a	n/a	n/a	n/a	1.7		n/a
2161000511			826-73-9	Heptane	ug/L	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000511			206-99-7	Methoxyacetone	ug/L	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
2161000511			75-09-2	Methylene Chloride	ug/L	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7		n/a
2161000511			91-20-3	Naphthalene	ug/L	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a
2161000511			99-99-3	Nitrobenzene	ug/L	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a
2161000511			110-59-8	Permethrin	ug/L	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a
2161000511			107-12-0	Propene	ug/L	92	<1.4	2.2	n/a	n/a	n/a	n/a	1.4		n/a
2161000511			110-85-1	Pyridine	ug/L	100	<3.8	4.8	n/a	n/a	n/a	n/a	3.8		n/a
2161000511			100-42-5	Styrene	ug/L	99	<1.6	2.0	n/a	n/a	n/a	n/a	1.6		n/a
2161000511			127-18-4	Tetrachloroethene	ug/L	100	<1.6	2.7	n/a	n/a	n/a	n/a	1.6		n/a
2161000511			108-98-3	Toluene	ug/L	92	<1.5	6.8	n/a	n/a	n/a	n/a	1.5		n/a
2161000511			75-01-6	Trichloroethene	ug/L	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a
2161000511			75-69-4	Trichloroethane	ug/L	100	<1.8	1.3	n/a	n/a	n/a	n/a	1.8		n/a

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 Y - Comment
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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-B
 Customer Sample ID: 16-08765-2-IN-B

Sample#	R	AM	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc	Err %	Qual Flags
VAPOR-TDU VQA 01																
S187030511			10061-01-5	cis-1,3-Dichloropropene	ug/S	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3			n/a/U
S187030511			103-05-4	n-Butyl acetate	ug/S	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4			n/a/U
S187030511			143-02-5	n-Heptane	ug/S	87	<1.4	1.7	n/a	n/a	n/a	n/a	1.4			n/a
S187030511			10061-02-6	trans-1,3-Dichloropropene	ug/S	116	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2			n/a/U

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 B - Blank Contamination
 Y - Comment
 MA - Not Analyzed, ND = Not Detected
 L - LCS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-C
 Customer Sample ID: 16-08765-2-IN-C

Sample #	AI	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spit Rec %	Det Limit	Col Eff %	Qual Flags
0161000512			79-34-5	GC25	97	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
0161000512			79-00-5	GC25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
0161000512			79-34-3	GC25	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
0161000512			79-30-4	GC25	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
0161000512			107-06-2	GC25	116	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
0161000512			340-75-6	GC25	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
0161000512			108-66-7	GC25	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a,U
0161000512			123-81-1	GC25	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
0161000512			71-36-3	GC25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
0161000512			111-70-6	GC25	76	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
0161000512			71-23-4	GC25	100	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a,U
0161000512			108-47-4	GC25	100	<3.1	<3.1	n/a	n/a	n/a	n/a	n/a	3.1	n/a,U
0161000512			1708-29-8	GC25	96	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
0161000512			78-93-3	GC25	93	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
0161000512			115-43-0	GC25	86	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
0161000512			201-78-0	GC25	90	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
0161000512			234-23-5	GC25	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
0161000512			78-94-4	GC25	87	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
0161000512			106-30-4	GC25	89	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
0161000512			108-68-3	GC25	90	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
0161000512			105-42-0	GC25	88	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
0161000512			108-10-1	GC25	94	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
0161000512			87-64-1	GC25	84	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	4.3	n/a,U
0161000512			75-05-8	GC25	83	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
0161000512			89-86-2	GC25	91	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
0161000512			107-13-1	GC25	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
0161000512			107-18-6	GC25	100	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
0161000512			107-00-1	GC25	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U

J - Estimated
 a - LCS Outside Range
 U - Less Than Detection Limit
 G - Qualitative
 B - Blank Contamination
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 29163968
 SODG Number:
 Customer Sample ID: 16-08765-3-IN-C
 Customer Sample ID: 16-08765-3-IN-C

Sample #	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc %	Qual Flags
1617000912	71-43-2		Benzene	MG25	95	<1.2	2.4	n/a	n/a	n/a	n/a	n/a	1.2	n/a
1617000912	100-47-0		Benzonitrile	MG25	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
1617000912	123-72-8		Buflural	MG25	110	<2.1	3.3	n/a	n/a	n/a	n/a	n/a	2.1	n/a
1617000912	109-74-0		Buflural	MG25	95	<1.2	1.3	n/a	n/a	n/a	n/a	n/a	1.2	n/a
1617000912	36-23-5		Carbon tetrachloride	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	108-90-7		Chlorobenzene	MG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	79-09-3		Chloroethane	MG25	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
1617000912	97-86-3		Chloroform	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	110-82-7		Cyclohexane	MG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	124-18-6		Decane	MG25	84	<2.8	2.9	n/a	n/a	n/a	n/a	n/a	2.8	n/a
1617000912	64-17-5		Ethanol	MG25	100	<7.4	28.0	n/a	n/a	n/a	n/a	n/a	7.4	n/a
1617000912	141-78-4		Ethyl acetate	MG25	90	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	100-41-4		Ethylbenzene	MG25	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	119-09-9		Formal	MG25	91	<1.6	9.3	n/a	n/a	n/a	n/a	n/a	1.6	n/a
1617000912	119-84-3		Hexane	MG25	91	<1.7	2.0	n/a	n/a	n/a	n/a	n/a	1.7	n/a
1617000912	828-73-9		Hexanetriole	MG25	93	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	129-99-7		Methoxyphenol	MG25	96	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	75-09-2		Methylene Chloride	MG25	97	9.8	3.5	n/a	n/a	n/a	n/a	n/a	2.7	n/a
1617000912	91-20-3		Naphthalene	MG25	94	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
1617000912	99-09-3		Nitrobenzene	MG25	90	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
1617000912	110-89-6		Nonanetriole	MG25	88	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	107-13-0		Propylbenzene	MG25	95	<1.4	2.7	n/a	n/a	n/a	n/a	n/a	1.4	n/a
1617000912	110-86-1		Pyridine	MG25	100	<3.8	5.2	n/a	n/a	n/a	n/a	n/a	3.8	n/a
1617000912	100-42-5		Styrene	MG25	99	<1.8	2.0	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	1271-33-4		Tetrahydrofuran	MG25	100	<1.8	24	n/a	n/a	n/a	n/a	n/a	1.8	n/a
1617000912	108-90-3		Toluene	MG25	90	<1.5	7.6	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	79-07-6		Trichloroethane	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
1617000912	79-09-4		Trichloroethylene	MG25	100	<1.8	11	n/a	n/a	n/a	n/a	n/a	1.8	n/a

J - Estimated
 B - Blank Contamination
 Y - Comment
 U - Less Than Detection Limit
 Q - Qualitative
 NA = Not Analyzed, MD = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201610066
 SDD Number:
 Customer Sample ID: 16-08765-2-IN-C
 Customer Sample ID: 16-08765-2-IN-C

Sample #	SI	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc'n %	Qual Flags
MSDCHEM_VQA_02															
2161000012			10081-01-9	Isr-1,3-Dichloropropane	ug/g	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
2161000012			123-98-4	n-Butyl acetate	ug/g	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2161000012			142-92-9	n-Heptane	ug/g	87	<1.4	10	n/a	n/a	n/a	n/a	1.4	n/a	U
2161000012			15061-02-6	trans-1,3-Dichloropropene	ug/g	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
 # - LCB Outside Range
 U - Units Than Detection Limit
 G - Qualitative
 B - Blank Contamination
 Y - Comment
 NA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDO Number:
 Customer Sample ID: 16-08765-2-IN-D
 Customer Sample ID: 16-08765-2-IN-D

Sample #	RI	MF	Gas #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Exp Rec %	Est Limit	Cor Err %	Qual Flags
VAPOR-TOU-VQA 82															
5161030513			79-34-5	1,1,2,2-Tetrachloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5161030513			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161030513			75-34-3	1,1-Dichloroethane	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5161030513			75-35-4	1,1-Chloroethane	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5161030513			107-06-2	1,2-Dichloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161030513			342-73-6	1,3-Dichloropropene (Total)	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a
5161030513			108-46-7	1,4-Dichlorobenzene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161030513			123-81-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161030513			71-38-1	1-Butanol	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161030513			111-75-8	1-Hexanol	NGS	75	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
5161030513			71-23-8	1-Propanol	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a
5161030513			508-47-4	2,4-Dimethylpyridine	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	n/a	3.1	n/a
5161030513			1768-29-8	2,5-Dihydrofuran	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5161030513			78-83-3	2-Butanone	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161030513			110-43-0	2-Heptanone	NGS	88	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161030513			201-78-6	2-Nonanone	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161030513			524-22-5	2-Methylfuran	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5161030513			78-84-4	2-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161030513			108-33-4	3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5161030513			108-69-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a
5161030513			109-42-6	4-Methyl-2-Pentanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5161030513			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161030513			87-64-1	Acetone	NGS	84	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	4.3	n/a
5161030513			75-05-5	Acetonitrile	NGS	80	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5161030513			98-88-2	Acetophenone	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5161030513			107-13-1	Arylmethyle	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5161030513			107-18-6	Methyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a
5161030513			107-05-1	Methyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a

J - Estimated
 # - LCS Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 MA - Not Analyzed, MD - Not Detected
 L - LIS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-0
 Customer Sample ID: 16-08765-2-IN-0

Sample #	E	M	CAZ #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VAPOR-TDU VQA 02															
5187030513			71-43-2	Benzene	MG25	95	<1.3	2.4	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5187030513			700-47-0	Benzonitrile	MG25	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			123-73-6	Butanal	MG25	110	<2.1	4.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5187030513			700-34-0	Butanediol	MG25	95	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5187030513			95-23-5	Carbon tetrachloride	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			100-99-7	Chlorobenzene	MG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			75-20-3	Chloroethane	MG25	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5187030513			87-68-3	Chloroform	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			110-82-7	Cyclohexane	MG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			134-16-4	Decane	MG25	84	<2.8	3.1	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5187030513			84-17-5	Ethanol	MG25	100	<7.4	21.0	n/a	n/a	n/a	n/a	7.4	n/a	n/a
5187030513			141-78-4	Ethyl acetate	MG25	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			100-41-4	Ethylbenzene	MG25	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			110-00-9	Formal	MG25	91	<1.8	5.0	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			110-54-3	Heptane	MG25	91	<1.7	24	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5187030513			828-73-8	Hexanitrile	MG25	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			126-98-7	Methacrylonitrile	MG25	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			75-08-2	Methylene Chloride	MG25	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5187030513			91-00-3	Naphthalene	MG25	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5187030513			90-05-3	Nitrobenzene	MG25	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5187030513			110-59-8	Permethrin	MG25	88	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			907-13-0	Propagandite	MG25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			110-86-1	Pyridine	MG25	100	<3.8	4.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5187030513			100-42-5	Styrene	MG25	99	<1.8	1.7	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			127-18-4	Tetrachloroethene	MG25	100	<1.8	1.5	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5187030513			108-88-3	Toluene	MG25	90	<1.5	4.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			79-47-6	Trichloroethene	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5187030513			71-49-4	Trichlorofluoromethane	MG25	100	<1.8	1.3	n/a	n/a	n/a	n/a	1.8	n/a	n/a

4 - Estimated
 5 - UCL Outside Range
 6 - Less Than Detection Limit
 7 - Qualitative
 8 - Blank Contamination
 9 - Comment
 NA = Not Analyzed, MD = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163000
 SDCS Number:
 Customer Sample ID: 16-00765-3-IN-D
 Customer Sample ID: 16-00765-3-IN-D

Sample #	R	AI	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Std Dev %	Det Limit	Conc %	Qual Flags
VAPOR: TOU VDA 12															
2167000513			10281-01-5	cis-1,3-Dichloropropene	MG25	100	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a J
2167000513			123-86-4	n-Butyl acetate	MG25	75	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a J
2167000513			142-92-5	n-Heptane	MG25	87	<1.4	30	n/a	n/a	n/a	n/a	n/a	1.4	n/a
2167000513			10061-62-6	trans-1,3-Dichloropropene	MG25	110	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a J

J - Estimated
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 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-E
 Customer Sample ID: 16-08765-2-IN-E

Sample #	MP	CAS#	Analyte	Unit	SDS %	Blank	Result	Duplicates	Average	RPD %	Exp Rec %	Est Limit	Col Err %	Qual Flags
VAPOR TOU VCL 02														
2181030514		79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2181030514		79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2181030514		79-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2181030514		79-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2181030514		107-06-2	1,2-Dichloroethane	NGS	112	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
2181030514		343-73-8	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2181030514		108-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
2181030514		123-81-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2181030514		71-38-3	1-Butanol	NGS	150	<8.9	3.60	n/a	n/a	n/a	n/a	8.9	n/a	n/a
2181030514		111-75-8	1-Heptanol	NGS	75	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
2181030514		71-23-8	1-Propanol	NGS	150	<3.8	2.5	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2181030514		508-47-4	2,4-Dimethylpyridine	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a
2181030514		1708-29-8	2,5-Dihydrofuran	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2181030514		79-83-3	2-Butanone	NGS	93	<1.9	3.0	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2181030514		110-43-0	2-Heptanone	NGS	88	<1.8	2.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181030514		291-78-8	2-Nonanone	NGS	88	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2181030514		534-23-9	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2181030514		78-84-4	2-Buten-2-one	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2181030514		108-33-4	2-Heptanone	NGS	89	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2181030514		108-99-3	2-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2181030514		109-42-9	4-Methyl-2-pentanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2181030514		108-10-1	4-Methyl-2-pentanone	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2181030514		87-84-1	Acetone	NGS	84	<4.3	22	n/a	n/a	n/a	n/a	4.3	n/a	n/a
2181030514		75-05-8	Acetonitrile	NGS	83	<1.8	1.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181030514		98-88-2	Acetophenone	NGS	91	<2.6	4.5	n/a	n/a	n/a	n/a	2.6	n/a	n/a
2181030514		107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2181030514		105-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2181030514		107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
 # - LCS Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163040
 SDC Number:
 Customer Sample ID: 16-08765-2-IN-E
 Customer Sample ID: 16-08765-2-IN-E

Sample #	S	AM	Cal #	Analyte	Unit	SDS %	Blank	Result	Duplicates	Average	RPD %	Spn Res %	Std Limit	Out Flag
VAPOR:TDU VOA 82														
S161000514			71-43-2	Benzene	NGS	95	<1.2	2.2	n/a	n/a	n/a	n/a	1.2	n/a
S161000514			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
S161000514			123-73-8	Bromal	NGS	110	<2.1	3.1	n/a	n/a	n/a	n/a	3.1	n/a
S161000514			109-74-9	Bromobenzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
S161000514			36-23-5	Carbon tetrachloride	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			75-05-3	Chloroethane	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
S161000514			87-68-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			119-83-7	Cylohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
S161000514			94-17-9	Ethanol	NGS	100	<7.4	19.0	n/a	n/a	n/a	n/a	7.4	n/a
S161000514			141-78-8	Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			119-05-9	Furan	NGS	91	<1.8	7.0	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			152-54-3	Hexane	NGS	91	<1.7	5.4	n/a	n/a	n/a	n/a	1.7	n/a
S161000514			508-73-9	Heptane	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			128-98-7	Methacrylonitrile	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			75-05-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S161000514			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
S161000514			99-86-3	Nitrobenzene	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
S161000514			119-59-8	Pentamethyl	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			507-13-0	Propene	NGS	92	<1.8	1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			119-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
S161000514			100-42-5	Styrene	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			127-18-4	Tetrahydrofuran	NGS	100	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	n/a
S161000514			108-89-3	Toluene	NGS	93	<1.5	3.4	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			79-04-6	Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161000514			75-09-4	Trichloroethylene	NGS	100	<1.8	1.1	n/a	n/a	n/a	n/a	1.8	n/a

4 - Estimated
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 G - Qualitative
 B - Blank Contamination
 Y - Comment
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 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-E
 Customer Sample ID: 16-08765-2-IN-E

Sample	SI	MI	CAI #	Analyte	Unit	STD %	Blank	Pass/Fail	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Err %	Qual Flags
VAPOR:TDU/VOL:12															
2187020514			10061-01-5	2,4,6-Trichlorophenols	ug/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
2187020514			123-86-4	n-Butyl acetate	ug/g	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	J
2187020514			142-82-5	n-Heptane	ug/g	87	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	J
2187020514			10061-02-6	2,4,6-Trichlorophenols	ug/g	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J

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 B - Blank Contamination
 Y - Comment
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 L - LLB Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160064
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-F
 Customer Sample ID: 16-08765-2-IN-F

Sample	R	AV	Lab #	Analyte	Unit	SDS %	Blank	Result	Duplicates	Average	RPD %	Exp Rec %	Est Limit	Col Eff %	Qual Flags
VAPOR-TOU VQA 02															
5187000015		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5187000015		79-00-5		1,1,2-Trichloroethane	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187000015		79-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5187000015		79-36-4		1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5187000015		107-06-3		1,3-Dichloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000015		843-79-8		1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	
5187000015		108-95-7		1,4-Dichlorobenzene	NGS	95	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a
5187000015		123-91-1		1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5187000015		71-36-3		1-Butanol	NGS	140	<8.9	480	n/a	n/a	n/a	n/a	n/a	8.9	n/a
5187000015		111-70-8		1-Heptanol	NGS	87	<5.8	<5.8	n/a	n/a	n/a	n/a	n/a	5.8	n/a
5187000015		71-23-9		1-Propanol	NGS	100	<3.5	87	n/a	n/a	n/a	n/a	n/a	3.5	n/a
5187000015		108-47-4		2,4-Dimethylpyridine	NGS	94	<3.1	<3.1	n/a	n/a	n/a	n/a	n/a	3.1	n/a
5187000015		1198-29-8		2,5-Dihydrofuran	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5187000015		78-82-3		2-Ethanolone	NGS	94	<1.9	5.8	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5187000015		150-43-0		2-Heptanone	NGS	95	<1.8	2.4	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000015		591-78-8		2-Hexanone	NGS	85	<1.2	1.7	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5187000015		334-22-0		2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5187000015		78-84-4		2-Buten-2-one	NGS	85	<1.7	2.6	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5187000015		508-35-4		3-Heptanone	NGS	88	<1.5	2.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5187000015		508-88-3		3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a
5187000015		109-42-0		4-Methyl-2-pentanone	NGS	85	<1.3	4.0	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5187000015		108-50-1		4-Methyl-3-pentanone	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000015		83-84-1		Acetone	NGS	81	<4.3	39	n/a	n/a	n/a	n/a	n/a	4.3	n/a
5187000015		75-05-6		Acetonitrile	NGS	81	<1.8	28	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000015		98-82-2		Acetophenone	NGS	88	<2.8	6.5	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5187000015		107-13-1		Anisole	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5187000015		107-18-4		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a
5187000015		107-09-1		Bis(1-Chloro	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SIDG Number:
 Customer Sample ID: 16-06765-2-IN-F
 Customer Sample ID: 16-06765-3-IN-F

Sample #	SI	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Con Em %	Qual Flags
VAPOR:TDU VQA:EG															
1617030515			71-43-2	Benzene	NC25	90	<1.2	2.8	n/a	n/a	n/a	n/a	1.2	n/a	n/a
1617030515			100-47-0	Benzonitrile	NC25	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
1617030515			123-73-8	Butanal	NC25	100	<2.1	4.9	n/a	n/a	n/a	n/a	2.1	n/a	n/a
1617030515			100-74-0	Butanenitrile	NC25	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
1617030515			56-23-5	Carbon tetrachloride	NC25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617030515			198-90-7	Chlorobenzene	NC25	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			75-09-3	Chloroethane	NC25	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
1617030515			87-68-3	Chloroform	NC25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			110-83-7	Cyclohexane	NC25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617030515			124-18-5	Decane	NC25	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617030515			84-17-5	Ethanol	NC25	100	<7.4	200	n/a	n/a	n/a	n/a	7.4	n/a	n/a
1617030515			641-78-8	Ethyl acetate	NC25	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			300-41-4	Ethylbenzene	NC25	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			110-50-9	Furan	NC25	86	<1.6	8.4	n/a	n/a	n/a	n/a	1.6	n/a	n/a
1617030515			110-54-3	Hexane	NC25	80	<1.7	19	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617030515			626-73-8	Hexanenitrile	NC25	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			128-98-7	Methacrylonitrile	NC25	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
1617030515			75-08-2	Methylene Chloride	NC25	90	<2.7	7.4	n/a	n/a	n/a	n/a	2.7	n/a	n/a
1617030515			91-30-3	Naphthalene	NC25	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
1617030515			90-85-3	Nitrobenzene	NC25	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617030515			110-59-8	Perchloroethylene	NC25	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617030515			101-13-0	Propene	NC25	80	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	n/a
1617030515			110-80-1	Pyridine	NC25	130	<3.8	3.9	n/a	n/a	n/a	n/a	3.8	n/a	n/a
1617030515			100-40-3	Styrene	NC25	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
1617030515			127-18-4	Tetrachloroethane	NC25	96	<1.8	6.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617030515			108-90-3	Toluene	NC25	80	<1.3	4.2	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617030515			74-01-6	Trichloroethane	NC25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617030515			75-09-4	Trichloroethylene	NC25	80	<1.8	1.7	n/a	n/a	n/a	n/a	1.8	n/a	n/a

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 Y - Comment
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 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDC Number:
 Customer Sample ID: 16-08765-2-IN-J
 Customer Sample ID: 16-08765-2-IN-J

Sample #	B	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Con Br %	Qual Flag
VAPOR-TOX/VQA/IE															
2167025515			10061-01-5	cis-1,3-Dichloropentane	ug/L	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
2167025515			123-66-4	n-Butyl acetate	ug/L	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2167025515			143-83-3	n-Heptane	ug/L	84	<1.4	33	n/a	n/a	n/a	n/a	1.4		n/a
2167025515			10061-02-6	trans-1,3-Dichloropentane	ug/L	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U

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 B - Blank Contamination
 Y - Comment
 MA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-G
 Customer Sample ID: 16-08765-2-IN-G

Sample	IN	AM	Cal #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Est Limit	Est Err %	Qual Flag
2187005516				79-34-5	1,1,2,2-Tetrachloroethane	MG5	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187005516				79-00-5	1,1,2-Trichloroethane	MG5	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187005516				79-34-3	1,1-Dichloroethane	MG5	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187005516				79-38-4	1,1-Dichloroethene	MG5	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187005516				107-66-2	1,3-Dichloroethane	MG5	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187005516				540-79-8	1,3-Dichloropropane (Total)	MG5	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187005516				108-65-7	1,4-Dichlorobenzene	MG5	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
2187005516				123-91-1	1,4-Dioxane	MG5	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187005516				71-36-3	1-Butanol	MG5	<8.9	11.0	n/a	n/a	n/a	n/a	8.9	n/a	n/a
2187005516				111-70-8	1-Heptanol	MG5	<8.8	<8.8	n/a	n/a	n/a	n/a	8.8	n/a	n/a
2187005516				71-23-8	1-Propanol	MG5	<3.0	4.5	n/a	n/a	n/a	n/a	3.0	n/a	n/a
2187005516				108-47-4	2,4-Dimethylpyridine	MG5	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a
2187005516				1708-29-8	2,5-Dihydrofuran	MG5	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187005516				78-93-3	2-Butanone	MG5	<1.9	4.2	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187005516				110-43-0	2-Heptanone	MG5	<1.8	1.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187005516				5071-78-8	2-Hexanone	MG5	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187005516				534-23-0	2-Methylfuran	MG5	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187005516				78-94-4	3-Buten-2-one	MG5	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187005516				108-38-4	3-Heptanone	MG5	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187005516				108-88-3	3-Octanone	MG5	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2187005516				105-42-0	4-Methyl-2-pentanone	MG5	<1.3	3.9	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187005516				108-10-1	4-Methyl-2-pentanone	MG5	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187005516				87-64-1	Acetone	MG5	<4.3	5.1	n/a	n/a	n/a	n/a	4.3	n/a	n/a
2187005516				75-05-8	Acetonitrile	MG5	<1.8	1.80	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187005516				58-86-2	Acetophenone	MG5	<2.8	3.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187005516				107-13-1	Aniline	MG5	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187005516				107-18-6	Allyl Alcohol	MG5	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
2187005516				707-05-1	Allyl Chloride	MG5	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

J - Estimated
 a - LCS Outside Range
 U - Less Than Detection Limit
 Q - Qualitative
 B - Blank Contamination
 Y - Comment
 MA - Not Analyzed, MD - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163066
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-G
 Customer Sample ID: 16-08765-2-IN-G

Sample	BI	AI	CAS#	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Br %	Qual Flag
VAPOR-TOU/PCA IE															
2187030516		71-43-2		Benzene	NGS	95	<1.2	1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		100-47-0		Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		123-73-8		BuAnal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		109-74-0		BuAcetnitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		66-23-5		Carbon tetrachloride	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		108-90-7		Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		75-00-3		Chloroethane	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		37-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		110-83-7		Cyclohexane	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		124-18-5		Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		84-17-3		Ethanol	NGS	100	<7.4	97	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		141-78-6		Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		100-41-4		Ethylbenzene	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		110-00-8		Furan	NGS	86	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		110-84-3		Hexane	NGS	85	<1.7	4.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		309-73-8		Heptane	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		126-99-7		Methylcyclopentane	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		75-09-2		Methylene Chloride	NGS	95	<2.7	8.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		91-20-3		Naphthalene	NGS	86	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		56-65-3		Nonane	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		110-09-8		Octane	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		103-12-9		Propylbenzene	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		110-88-3		Pyridine	NGS	152	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		100-42-5		Styrene	NGS	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		127-18-4		Tetrachloroethane	NGS	99	<1.8	6.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		108-88-3		Toluene	NGS	85	<1.9	4.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		78-01-6		Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2187030516		75-69-4		Trichloroethylene	NGS	93	<1.8	4.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a

J - Estimated
 B - Blank Contamination
 U - Less Than Detection Limit
 Y - Comment
 # - LCS Outside Range
 MA - Not Analyzed, ND - Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162016

SDG Number:

Customer Sample ID: 16-08765-2-IN-G

Customer Sample ID: 16-08765-2-IN-G

Sample#	SI	AM	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Resp %	Std Limit	Col Eff %	Qual Flags
VAPOR: 100 VOA 10															
1617000516			10081-01-4	cis-1,3-Dichloropropene	MG/L	100	<1.3	<1.3	n/a	n/a	n/a	n/a	5.3	n/a	J
1617000516			10081-01-4	trans-1,3-Dichloropropene	MG/L	74	<1.4	<1.4	n/a	n/a	n/a	n/a	5.4	n/a	J
1617000516			142-82-5	2-Heptane	MG/L	84	<1.4	5.4	n/a	n/a	n/a	n/a	5.4	n/a	J
1617000516			10081-02-4	trans-1,3-Dichloropropene	MG/L	110	<1.2	<1.2	n/a	n/a	n/a	n/a	5.2	n/a	J

J - Estimated
 a - LCS Outside Range

U - Less Than Detection Limit
 Q - Qualitative

B - Blank Contamination
 Y - Comment

NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range
 E - Outside Calibration Range

Signature
 12/15/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 29163965

SQG Number:

Customer Sample ID: 16-08765-3-EFF-A

Customer Sample ID: 16-08765-3-EFF-A

Sample	Q	MS	Gas #	Groups	Unit	STD %	Blank	Result	Duplicates	Average	RSD %	Spk Ret %	Det Limit	Col Eff %	Qual Flags
VAMPOR-TDU VOA.BE															
5187020404			75-34-5	1,1,2,2-Tetrachloroethane	NG05	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
5187020404			75-00-5	1,1,3-Trichloroethane	NG05	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
5187020404			75-34-3	1,1-Dichloroethane	NG05	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
5187020404			75-35-4	1,1-Dichloroethene	NG05	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
5187020404			107-06-2	1,2-Dichloroethane	NG05	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
5187020404			542-75-6	1,3-Dichloropropene (Total)	NG05	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
5187020404			106-46-7	1,4-Dichlorobenzene	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
5187020404			123-91-1	1,4-Dioxane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
5187020404			71-36-3	1-Butanol	NG05	140	<8.9	8.1	n/a	n/a	n/a	n/a	8.9	n/a	YVa
5187020404			111-70-8	1-Heptanol	NG05	91	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	U
5187020404			71-23-8	1-Propanol	NG05	120	<3.0	17	n/a	n/a	n/a	n/a	3.0	n/a	U
5187020404			106-87-4	3,4-Dimethylpyridine	NG05	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
5187020404			1768-29-8	3,5-Diethylurea	NG05	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
5187020404			78-83-3	2-Butanone	NG05	94	<1.8	2.0	n/a	n/a	n/a	n/a	1.8	n/a	U
5187020404			110-43-0	2-Heptanone	NG05	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
5187020404			591-78-8	3-Hexanone	NG05	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
5187020404			534-33-3	3-Methylurea	NG05	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
5187020404			78-94-4	3-Butyl-2-one	NG05	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
5187020404			106-35-4	3-Heptanone	NG05	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
5187020404			106-68-3	3-Octanone	NG05	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
5187020404			100-42-0	4-Methyl-2-pentanone	NG05	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
5187020404			109-10-1	4-Methyl-2-pentanone	NG05	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
5187020404			87-44-1	Acetone	NG05	88	<4.3	4.8	n/a	n/a	n/a	n/a	4.3	n/a	U
5187020404			75-05-8	Acetonitrile	NG05	84	<1.8	1.0E+03	n/a	n/a	n/a	n/a	1.8	n/a	E
5187020404			58-85-2	Acetophenone	NG05	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
5187020404			107-13-1	Acrylonitrile	NG05	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
5187020404			107-19-8	Allyl Alcohol	NG05	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
5187020404			107-03-1	Allyl Chloride	NG05	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
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 E - Outside Calibration Range
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 T - Tentatively Identified Compound
 NA = Not Analyzed, ND = Not Detected
 N = Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDCG Number:
 Customer Sample ID: 16-08765-2-EFF-A
 Customer Sample ID: 16-08765-2-EFF-A

Sample #	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc Bin %	Qual Flags
VAPORS:TDU VDA.BI														
51610306494		71-43-2	Benzene	MG5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
51610306494		100-47-0	Benzonitrile	MG5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
51610306494		123-73-8	Butanal	MG5	110	<2.1	2.4	n/a	n/a	n/a	n/a	n/a	2.1	n/a,U
51610306494		108-74-0	Butanenitrile	MG5	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
51610306494		99-23-9	Carbon tetrachloride	MG5	120	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		108-90-7	Chlorobenzene	MG5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		75-00-3	Chloroethane	MG5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
51610306494		87-86-3	Chloroform	MG5	115	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		110-83-7	Cyclohexane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		524-18-6	Decane	MG5	84	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
51610306494		84-17-6	Ethanol	MG5	120	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
51610306494		741-78-6	Ethyl acetate	MG5	82	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		100-41-4	Ethylbenzene	MG5	98	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		110-00-8	Furan	MG5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		110-94-3	Hexane	MG5	95	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
51610306494		828-73-9	Hexanenitrile	MG5	98	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		526-88-7	Methacrylonitrile	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		75-08-3	Methylene Chloride	MG5	97	3.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a,U
51610306494		91-20-3	Naphthalene	MG5	91	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a,U
51610306494		84-85-3	Nitrobenzene	MG5	80	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
51610306494		110-59-8	Pentanitrile	MG5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		107-12-0	Propenenitrile	MG5	98	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a,U
51610306494		110-86-1	Pyridine	MG5	120	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a,U
51610306494		100-42-9	Styrene	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
51610306494		527-18-4	Tetrachloroethene	MG5	100	<1.8	35	n/a	n/a	n/a	n/a	n/a	1.8	n/a
51610306494		108-88-3	Toluene	MG5	80	<1.5	3.1	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		75-01-6	Trichloroethene	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
51610306494		75-89-4	Trichloroethylene	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U

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 NA = Not Analyzed, MD = Not Detected
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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 29163065
 SDCG Number:
 Customer Sample ID: 16-08765-3-EFF-A
 Customer Sample ID: 16-08765-3-EFF-A

Sample #	Alt #	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Ret %	Det Limit	Col Eff %	Qual Flags
VMPOR-TDU VQA.B2														
S187020494		10091-91-9	trans-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S187020494		123-66-4	n-Butyl acetate	NGS	76	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S187020494		142-82-3	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S187020494		10091-92-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a

NA = Not Analyzed, ND = Not Detected
 M = Named TIC
 L = LLS Outside Range

U = Less Than Detection Limit
 T = Tentatively Identified Compound

E = Outside Calibration Range
 J = Estimated

Y = Comment
 a = LCS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 29163005
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-B
 Customer Sample ID: 16-08765-3-EFF-B

Sample	R	M	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Ref Limit	Out Err %	Qual Flags
VAPOR-TDU VQA-B2															
2187020405			79-34-5	1,1,2-Trihaloethane	%GS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187020405			79-09-5	1,1,2-Trichloroethane	%GS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187020405			75-34-3	1,1-Dichloroethane	%GS	98	<1.3	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020405			75-35-4	1,1-Dichloroethene	%GS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187020405			107-06-2	1,2-Dichloroethane	%GS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020405			242-75-4	1,3-Dichloropropane (Total)	%GS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020405			100-46-7	1,4-Dichlorobenzene	%GS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
2187020405			123-91-1	1,4-Dioxane	%GS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020405			71-58-3	1-Butanediol	%GS	140	<8.8	<8.9	n/a	n/a	n/a	n/a	8.8	n/a	n/a
2187020405			111-70-4	1-Heptanol	%GS	91	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	n/a
2187020405			71-42-8	1-Propanol	%GS	120	<3.0	55	n/a	n/a	n/a	n/a	3.0	n/a	n/a
2187020405			100-47-4	2,4-Dimethylpyridine	%GS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
2187020405			1709-29-8	2,5-Dihydrofuran	%GS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187020405			78-63-3	2-Butanone	%GS	94	<1.9	2.8	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020405			119-43-0	2-Heptanone	%GS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020405			281-78-4	2-Hexanone	%GS	90	<1.7	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
2187020405			534-23-5	2-Methylfuran	%GS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020405			79-94-4	3-Buten-2-one	%GS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020405			100-26-4	3-Heptanone	%GS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
2187020405			100-48-3	3-Octanone	%GS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2187020405			109-43-0	4-Methyl-2-Pentanone	%GS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
2187020405			109-10-1	4-Methyl-2-Pentanone	%GS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
2187020405			87-64-1	Acetone	%GS	88	<4.3	7.2	n/a	n/a	n/a	n/a	4.3	n/a	n/a
2187020405			75-05-8	Acetonitrile	%GS	84	<1.8	55	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2187020405			88-69-2	Acetophenone	%GS	91	<2.8	2.9	n/a	n/a	n/a	n/a	2.8	n/a	n/a
2187020405			107-13-1	Acrylonitrile	%GS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
2187020405			107-18-4	Methyl Alcohol	%GS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
2187020405			101-06-1	Methyl Chloride	%GS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

Y - Comment
 n - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 NA - Not Analyzed, MD - Not Detected
 M - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163005
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-B
 Customer Sample ID: 16-08765-2-EFF-B

Sample #	AI	MSI	Case #	Analyte	Unit	RTD %	Blank	Result	Duplicates	Average	RSD %	Spk Res %	Std Limit	Col Eff %	Qual Flags
VAPORS TOU VOCs BE															
2167035495			71-43-2	Benzene	MO5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/aU
2167035495			100-47-0	Benzonitrile	MO5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/aU
2167035495			123-73-8	Bulonal	MO5	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/aU
2167035495			109-14-0	Bulamerinils	MO5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/aU
2167035495			56-23-5	Carbon tetrachloride	MO5	105	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			109-90-7	Chlorobenzene	MO5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			75-00-3	Chloroethane	MO5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/aU
2167035495			37-69-3	Chloroform	MO5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			119-80-7	Cyclohexane	MO5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			124-18-5	Decane	MO5	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/aU
2167035495			64-17-5	Ethanol	MO5	100	<2.4	19	n/a	n/a	n/a	n/a	2.4		n/aU
2167035495			141-78-6	Ethyl acetate	MO5	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			100-41-4	Ethylbenzene	MO5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			119-00-8	Furan	MO5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			119-84-3	Hexane	MO5	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/aU
2167035495			828-73-9	Heptanitrile	MO5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			126-58-7	Methoxybenzole	MO5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			75-09-2	Methylene Chloride	MO5	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/aLU
2167035495			91-20-3	Naphthalene	MO5	91	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/aU
2167035495			50-00-3	Nitrobenzene	MO5	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/aU
2167035495			110-09-8	Pentanitrile	MO5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			107-12-0	Propenenitrile	MO5	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/aU
2167035495			110-86-1	Pyridine	MO5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/aU
2167035495			100-42-5	Styrene	MO5	105	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU
2167035495			127-18-4	Tetrachloroethane	MO5	100	<1.6	29	n/a	n/a	n/a	n/a	1.6		n/a
2167035495			109-69-3	Toluene	MO5	92	<1.5	3.1	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			79-01-2	Trichloroethane	MO5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/aU
2167035495			75-09-4	Trichlorofluoroethane	MO5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/aU

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 # - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 NA = Not Analyzed, ND = Not Detected
 N = Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-04765-3-EFF-B
 Customer Sample ID: 16-04765-3-EFF-B

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Col Eff %	Qual Flags
VIAFOR-TOU VOA.BE															
51870304695			50061-01-8	trans-1,3-Dichloropropene	MG/G	110	<1.2	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
51870304695			50061-01-8	trans-1,3-Dichloropropene	MG/G	28	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
51870304695			50061-02-6	cis-1,3-Dichloropropene	MG/G	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
51870304695			50061-02-6	cis-1,3-Dichloropropene	MG/G	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a

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 a - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 M - Not Analyzed, ND - Not Detected
 N - Named TIC
 L - U.S. Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-C
 Customer Sample ID: 16-08765-2-EFF-C

Sample	SI	AM	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Std Bias %	Std Limit	Std Err %	Qual Flags
VAPOR:TDU VOA BE															
5181030406			75-34-5	1,1,2,2-Tetrachloroethane	MG/L	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030406			75-35-5	1,1,2-Trichloroethane	MG/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030406			75-34-3	1,1-Dichloroethane	MG/L	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030406			75-35-4	1,1-Dichloroethane	MG/L	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030406			107-06-2	1,2-Dichloroethane	MG/L	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181030406			243-75-6	1,3-Dichloropropane (Total)	MG/L	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030406			108-66-7	1,4-Dichlorobenzene	MG/L	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
5181030406			123-91-1	1,4-Dioxane	MG/L	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030406			71-36-3	1-Butanol	MG/L	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	n/a
5181030406			111-70-8	1-Heptanol	MG/L	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a
5181030406			71-23-8	1-Propanol	MG/L	120	<3.0	7.8	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5181030406			108-87-4	3,4-Dimethylpyridine	MG/L	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5181030406			128-29-8	2,5-Dihydrofuran	MG/L	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030406			78-83-3	2-Butanone	MG/L	94	<1.9	3.3	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030406			115-83-0	2-Heptanone	MG/L	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181030406			281-78-8	2-Hexanone	MG/L	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030406			234-23-0	2-Methylfuran	MG/L	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030406			78-84-4	3-Buten-2-one	MG/L	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030406			106-38-4	3-Heptanone	MG/L	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030406			106-65-3	3-Octanone	MG/L	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5181030406			105-42-0	4-Methyl-2-hexanone	MG/L	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030406			158-10-1	4-Methyl-2-pentanone	MG/L	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030406			87-62-1	Acetone	MG/L	85	<4.2	13	n/a	n/a	n/a	n/a	4.2	n/a	n/a
5181030406			75-05-8	Acetonitrile	MG/L	84	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030406			88-86-2	Acetophenone	MG/L	91	<2.8	3.3	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030406			107-13-1	Aryloxide	MG/L	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030406			107-18-6	Methyl Alcohol	MG/L	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
5181030406			107-05-1	Methyl Chloride	MG/L	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

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 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 MA - Not Analyzed, MD - Not Detected
 N - Named TIC
 L - ILS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-C
 Customer Sample ID: 16-08765-3-EFF-C

Sample	B	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Br %	Qual Flags
VAPOR-TDU VQA 10															
S181030406			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
S181030406			100-47-0	Benzonitrile	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			123-72-8	Bufoal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
S181030406			100-14-0	Butanenitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
S181030406			56-23-5	Carbon tetrachloride	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			100-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
S181030406			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			150-83-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
S181030406			84-17-3	Ethanol	NGS	100	<7.4	54	n/a	n/a	n/a	n/a	n/a	7.4	n/a
S181030406			541-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			100-41-4	Ethylbenzene	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			116-30-9	Furan	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
S181030406			828-73-8	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			126-85-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a
S181030406			91-30-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a
S181030406			98-05-3	Nitrobenzene	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
S181030406			119-39-8	Permethrin	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			115-86-1	Pyridine	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a
S181030406			100-42-5	Styrene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			127-18-4	Tetrachloroethane	NGS	100	<1.8	35	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S181030406			108-88-3	Toluene	NGS	92	<1.5	3.8	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			79-01-5	Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S181030406			75-09-4	Trichloroethylene	NGS	100	<1.8	2.0	n/a	n/a	n/a	n/a	n/a	1.8	n/a

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 T - Tentatively Identified Compound
 MA - Not Analyzed, MD - Not Detected
 N - Mismatch TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 29162063
 SDC Number:
 Customer Sample ID: 16-08765-3-EFF-C
 Customer Sample ID: 16-08765-3-EFF-C

Sample #	Q	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spn Rec %	Std Limit	Col Err %	Qual Flags
VAPOR:TDU VDA EQ															
S161000498			10261-01-8	cis-1,3-Dichloropropene	NGS	110	<1.2	<1.3	n/a	n/a	n/a	n/a	1.2		n/a,U
S161000498			123-86-4	n-Butyl acetate	NGS	38	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
S161000498			142-82-5	n-Heptane	NGS	90	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
S161000498			10261-02-8	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U

Y - Comment
 # - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 NA - Not Analyzed, ND - Not Detected
 N - Named TIC
 L - U.S. Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-D
 Customer Sample ID: 16-08765-2-EFF-D

Sample #	El	AI	CAI #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spot Rec %	Ret Limit	Col Eff %	Qual Flags
5181030487				1,1,1,3-Tetrafluoroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030487				1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030487				1,1-Dichloroethane	NGS	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030487				1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030487				1,2-Dichloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030487				1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030487				1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
5181030487				1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030487				1-Butanol	NGS	140	<8.6	11	n/a	n/a	n/a	n/a	8.6	n/a	n/a
5181030487				1-Propanol	NGS	91	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
5181030487				2-Propanol	NGS	120	<3.0	18	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5181030487				2,4-Dimethylpyridine	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030487				2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030487				2-Butanone	NGS	94	<1.6	2.7	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181030487				2-Heptanone	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030487				2-Heptanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030487				2-Methylfuran	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
5181030487				2-Butan-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030487				3-Heptanone	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030487				3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5181030487				4-Methyl-2-Pentanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181030487				4-Methyl-2-Pentanone	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030487				Acetone	NGS	84	<4.3	6.3	n/a	n/a	n/a	n/a	4.3	n/a	n/a
5181030487				Acetonitrile	NGS	84	<1.8	7.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030487				Acetophenone	NGS	91	<2.8	2.7	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030487				Amyl Alcohol	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030487				Methyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
5181030487				Methyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

T - Comment
 # - LCL Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 F - Tentatively Identified Compound
 NA = Not Analyzed, MD = Not Detected
 H = Named TIC
 L = LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162062
 S/GG Number:
 Customer Sample ID: 16-08765-2-EFF-0
 Customer Sample ID: 16-08765-2-EFF-0

Sample#	S	M	Lab #	Analyte	Unit	RTS %	Blank	Result	Duplicates	Average	RPD %	Spk Res %	Ret Limit	Qual Flags
VAPOR:TDU VOA 82														
5161005497			71-43-2	Benzene	MG5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
5161005497			700-47-0	Benzonitrile	MG5	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.9	n/a
5161005497			703-72-8	Butanol	MG5	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
5161005497			109-74-0	Butanenitrile	MG5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.3	n/a
5161005497			56-23-5	Carbon tetrachloride	MG5	120	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			108-90-7	Chlorobenzene	MG5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			75-00-3	Chloroethane	MG5	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5161005497			87-86-3	Chlorobenz	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			110-82-7	Cyclohexane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			124-18-5	Decane	MG5	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5161005497			64-17-5	Ethanol	MG5	120	<7.4	98	n/a	n/a	n/a	n/a	7.4	n/a
5161005497			141-78-8	Ethyl acetate	MG5	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			100-41-4	Ethylbenzene	MG5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			115-00-8	Furan	MG5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			110-54-3	Hexane	MG5	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
5161005497			508-73-9	Hexanenitrile	MG5	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			128-86-7	Methylcyclopentane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			75-09-2	Methylene Chloride	MG5	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
5161005497			91-20-3	Naphthalene	MG5	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
5161005497			99-06-3	Nitrobenzene	MG5	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5161005497			110-59-8	Permethrin	MG5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			107-13-0	Propenenitrile	MG5	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			110-86-1	Pyridine	MG5	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
5161005497			100-42-5	Styrene	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5161005497			127-18-4	Tetrachloroethene	MG5	100	<1.5	26	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			108-88-3	Toluene	MG5	90	<1.5	2.9	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			79-01-6	Trichloroethene	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5161005497			75-09-4	Trichlorofluoromethane	MG5	110	<1.8	2.2	n/a	n/a	n/a	n/a	1.8	n/a

T - Comment
 # - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 NA = Not Analyzed, ND = Not Detected
 H - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-E
 Customer Sample ID: 16-08765-3-EFF-E

Sample	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Carbin %	Qual Flag
VAPOR-TDU VDA IE															
21610034698			76-34-5	1,1,2,2-Tetrachloroethane	MO5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
21610034698			76-00-5	1,1,2-Trichloroethane	MO5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
21610034698			76-34-3	1,1-Dichloroethane	MO5	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a
21610034698			76-35-4	1,1-Dichloroethene	MO5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
21610034698			107-66-2	1,3-Dichloroethane	MO5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.6	n/a	n/a
21610034698			543-75-8	1,3-Dichloropropene (Total)	MO5	n/a	n/a	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a
21610034698			106-65-7	1,4-Dichlorobenzene	MO5	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
21610034698			123-81-1	1,4-Dioxane	MO5	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
21610034698			71-36-3	1-Butanol	MO5	145	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	n/a
21610034698			111-70-8	1-Heptanol	MO5	91	<8.8	<8.8	n/a	n/a	n/a	n/a	8.8	n/a	n/a
21610034698			71-23-8	1-Propanol	MO5	100	<3.0	17	n/a	n/a	n/a	n/a	3.0	n/a	n/a
21610034698			106-47-4	2,4-Dimethylpyridine	MO5	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
21610034698			1746-29-8	2,5-Dihydrofuran	MO5	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
21610034698			76-00-3	2-Butanone	MO5	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21610034698			110-43-0	2-Heptanone	MO5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21610034698			561-75-8	2-Nonanone	MO5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a
21610034698			534-22-5	2-Methylbutan	MO5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21610034698			76-04-4	3-Buten-2-one	MO5	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
21610034698			106-35-4	3-Heptanone	MO5	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
21610034698			106-66-3	3-Octanone	MO5	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
21610034698			100-42-0	4-Methyl-2-pentanone	MO5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
21610034698			109-10-1	4-Methyl-2-pentanone	MO5	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
21610034698			37-64-1	Acetone	MO5	86	<4.3	5.8	n/a	n/a	n/a	n/a	4.3	n/a	n/a
21610034698			76-05-8	Acetonitrile	MO5	94	<1.8	3.4	n/a	n/a	n/a	n/a	1.8	n/a	n/a
21610034698			56-86-2	Acetophenone	MO5	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
21610034698			100-13-1	Acrylonitrile	MO5	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
21610034698			100-18-4	Allyl Alcohol	MO5	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
21610034698			107-05-1	Allyl Chloride	MO5	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a

Y - Comment
 # - LGS Outside Range
 E - Outside Calibration Range
 J - Estimated
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 T - Tentatively Identified Compound
 MA - Not Analyzed, ND = Not Detected
 M - Handed TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-E
 Customer Sample ID: 16-08765-3-EFF-E

Sample #	IC	MS	CAS #	Analysis	Unit	RTD %	Blank	Result	Duplicates	Average	RPD %	Std Dev %	Dev Limit	Carb. % Qual Flag
VAPOUR-TOU VOA.BE														
5187030498			71-43-2	Benzene	ug/L	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
5187030498			100-47-0	Benzonitrile	ug/L	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030498			123-73-8	Butanal	ug/L	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
5187030498			109-74-0	Butanenitrile	ug/L	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
5187030498			56-23-5	Carbon tetrachloride	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			106-80-7	Chlorobenzene	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			75-00-3	Chloroethane	ug/L	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030498			87-86-3	Chloroform	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			119-83-7	Cyclohexane	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			124-16-5	Decane	ug/L	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5187030498			84-17-3	Ethanol	ug/L	100	<7.4	89	n/a	n/a	n/a	n/a	7.4	n/a
5187030498			141-78-4	Ethyl acetate	ug/L	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			100-41-4	Ethylbenzene	ug/L	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			119-00-9	Furan	ug/L	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			119-04-3	Hexane	ug/L	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
5187030498			108-73-9	Heptanenitrile	ug/L	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			126-99-7	Methoxybenzene	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			75-09-2	Methylene Chloride	ug/L	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
5187030498			91-20-3	Naphthalene	ug/L	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
5187030498			98-06-3	Nitrobenzene	ug/L	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5187030498			119-09-8	Pentanitrile	ug/L	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
5187030498			107-12-0	Propanenitrile	ug/L	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
5187030498			119-85-1	Pyridine	ug/L	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
5187030498			100-42-6	Styrene	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			127-18-4	Tetrachloroethane	ug/L	100	<1.8	27	n/a	n/a	n/a	n/a	1.8	n/a
5187030498			106-98-3	Toluene	ug/L	92	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a
5187030498			76-01-6	TriChloroethane	ug/L	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030498			75-89-4	Trichloroethylene	ug/L	100	<1.8	4.7	n/a	n/a	n/a	n/a	1.8	n/a

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 J - Estimated
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 T - Tentatively Identified Compound
 MA - Not Analyzed, ND = Not Detected
 N - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-E
 Customer Sample ID: 16-08765-3-EFF-E

Sample	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Std Limit	Col Eff %	Qual Flags
VAPOR-TOU/VQA IE															
S161005498			10061-01-5	cis-1,3-Dichloropentane	MG5	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S161005498			123-66-4	n-Butyl acetate	MG5	76	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S161005498			143-83-3	n-Hexane	MG5	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S161005498			10061-02-6	trans-1,3-Dichloropentane	MG5	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U

Y - Comment
 a - LCS Outside Range
 E - Outside Calibration Range
 J - Estimated
 U - Less Than Detection Limit
 T - Tentatively Identified Compound
 NA - Not Analyzed, MD - Not Detected
 N - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-F
 Customer Sample ID: 16-08765-2-EFF-F

Sample	IN	AM	Cal #	Analyte	Unit	STD %	Block	Result	Duplicate	Average	RSD %	Spk Rec %	Ret Limit	Col Eff %	Qual Flags
VAPOR: TOU/VQA (E)															
5181035499		75-34-5		1,1,2,2-Tetrachloroethane	MG5	97	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5181035499		75-00-5		1,1,2,2-Tetrachloroethane	MG5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5181035499		75-34-3		1,1-Dichloroethane	MG5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5181035499		75-30-4		1,1-Dichloroethane	MG5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5181035499		107-08-2		1,3-Dichloroethane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181035499		343-79-8		1,3-Dichloropropane (Total)	MG5	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5181035499		109-66-7		1,4-Dichlorobenzene	MG5	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a
5181035499		123-91-1		1,4-Dioxane	MG5	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5181035499		71-36-3		1-Butanol	MG5	100	<8.9	24	n/a	n/a	n/a	n/a	n/a	8.9	n/a
5181035499		111-75-8		1-Heptanol	MG5	78	<5.8	<5.8	n/a	n/a	n/a	n/a	n/a	5.8	n/a
5181035499		71-03-8		1-Propanol	MG5	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a
5181035499		108-47-4		2,4-Dimethylpyridine	MG5	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a
5181035499		1108-20-8		2,5-Dihydrofuran	MG5	99	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5181035499		78-83-3		2-Butanone	MG5	93	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5181035499		150-43-0		2-Heptanone	MG5	98	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181035499		591-78-8		2-Nonanone	MG5	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a
5181035499		334-22-0		2-Methylfuran	MG5	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5181035499		78-84-1		2-Buten-2-one	MG5	97	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5181035499		108-35-4		2-Heptanone	MG5	99	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a
5181035499		106-88-3		2-Octanone	MG5	90	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a
5181035499		108-92-9		4-Methyl-2-hexanone	MG5	98	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
5181035499		108-10-1		4-Methyl-2-pentanone	MG5	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
5181035499		87-44-1		Acetone	MG5	94	<4.3	13	n/a	n/a	n/a	n/a	n/a	4.3	n/a
5181035499		75-05-8		Acetonitrile	MG5	93	<1.8	475	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5181035499		98-88-2		Acetophenone	MG5	91	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
5181035499		105-13-1		Acrylonitrile	MG5	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
5181035499		107-18-8		Methyl Alcohol	MG5	100	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a
5181035499		107-05-1		Methyl Chloride	MG5	84	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a

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 E - Outside Calibration Range
 U - Less Than Detection Limit
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 MA - Not Analyzed, MD - Not Detected
 N - Mismatch TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDC Number:
 Customer Sample ID: 16-08765-3-EFF-F
 Customer Sample ID: 16-08765-3-EFF-F

Sample #	AM	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Per Limit	Col Eff %	Qual Flags
VAPORS TOU VOA.BI														
5167005409		71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5167005409		500-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5167005409		123-72-8	Subanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5167005409		109-74-0	Subanitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5167005409		56-23-5	Carbon tetrachloride	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		75-05-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5167005409		87-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		116-83-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5167005409		84-17-9	Ethanol	NGS	100	<7.4	94	n/a	n/a	n/a	n/a	7.4	n/a	n/a
5167005409		54-178-6	Ethyl acetate	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		116-30-8	Furan	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		110-54-3	Hexane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5167005409		828-73-8	Hexanitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		126-85-7	Methacrylonitrile	NGS	96	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		75-09-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5167005409		81-20-3	Naphthalene	NGS	84	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5167005409		98-82-3	Nitrobenzene	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5167005409		110-59-8	Nonanitrile	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		101-12-0	Propanitrile	NGS	90	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
5167005409		116-85-1	Pyridine	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5167005409		100-42-5	Styrene	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		127-18-4	Tetrachloroethene	NGS	100	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005409		106-85-3	Toluene	NGS	90	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		78-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005409		75-69-4	Trichloroethane	NGS	100	<1.8	4.7	n/a	n/a	n/a	n/a	1.8	n/a	n/a

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-F
 Customer Sample ID: 16-08765-3-EFF-F

Sample#	IR	AI	CAS #	Analysis	Unit	STD %	Blank	Mass%	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Con Br %	Qual Flag
VAPOR-TDU VOA_02															
218702499			10061-24-5	cis-1,3-Dichloropentane	ng/GS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.2		n/a/U
218702499			123-86-4	n-Butyl acetate	ng/GS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
218702499			143-83-3	n-Heptane	ng/GS	87	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
218702499			10061-02-6	trans-1,3-Dichloropentane	ng/GS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-G
 Customer Sample ID: 16-08765-2-EFF-G

Sample	IN	AM	Cal #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VAPOR:TDU/VQA (G)															
5181000000			75-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5181000000			75-30-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5181000000			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5181000000			75-38-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
5181000000			103-66-2	1,3-Dichloroethane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5181000000			343-75-8	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5181000000			106-45-7	1,4-Dichlorobenzene	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
5181000000			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5181000000			71-36-3	1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	n/a	8.9	n/a,U
5181000000			111-70-8	1-Heptanol	NGS	91	<5.8	<5.8	n/a	n/a	n/a	n/a	n/a	5.8	n/a,U
5181000000			71-23-8	1-Propanol	NGS	100	<3.9	14	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
5181000000			168-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a,U
5181000000			1708-20-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
5181000000			78-83-3	2-Ethanol	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
5181000000			115-43-0	2-Heptanone	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5181000000			591-78-8	2-Heptanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
5181000000			234-23-0	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
5181000000			78-84-4	2-Buten-2-one	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5181000000			108-35-4	2-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
5181000000			108-88-3	2-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
5181000000			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
5181000000			108-15-1	4-Methyl-2-pentanone	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5181000000			87-64-1	Acetone	NGS	98	<4.3	5.9	n/a	n/a	n/a	n/a	n/a	4.3	n/a,U
5181000000			75-05-8	Acetonitrile	NGS	84	<1.8	11	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
5181000000			98-86-2	Acetophenone	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
5181000000			101-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
5181000000			101-83-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
5181000000			101-05-1	Allyl Chloride	NGS	85	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-G
 Customer Sample ID: 16-08765-2-EFF-G

Sample #	AM	Cal #	Analyte	Unit	RPD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con for % Qual Flags
VAPOR:TDU/VGA ID													
5187030500		71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
5187030500		100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030500		123-73-8	Buflural	NGS	116	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
5187030500		109-14-9	Butenitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
5187030500		56-23-5	Carbon tetrachloride	NGS	126	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030500		75-69-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030500		87-46-3	Chloroform	NGS	112	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030500		110-83-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		124-18-9	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5187030500		84-17-5	Ethanol	NGS	100	<1.4	1.0	n/a	n/a	n/a	n/a	7.4	n/a
5187030500		141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030500		100-41-4	Ethylbenzene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
5187030500		110-02-8	Furan	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		150-84-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
5187030500		828-73-9	Heptane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
5187030500		128-99-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	3.7	n/a
5187030500		91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
5187030500		99-99-3	Nitrobenzene	NGS	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
5187030500		110-99-8	Permethrin	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		101-52-6	Propene	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
5187030500		115-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
5187030500		100-42-5	Styrene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		127-18-4	Tetrachloroethane	NGS	100	<1.8	14	n/a	n/a	n/a	n/a	1.8	n/a
5187030500		104-89-3	Toluene	NGS	90	<1.5	2.7	n/a	n/a	n/a	n/a	1.5	n/a
5187030500		75-01-6	Trichloroethane	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
5187030500		75-09-4	Trichlorofluoromethane	NGS	110	<1.8	3.0	n/a	n/a	n/a	n/a	1.8	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-G
 Customer Sample ID: 16-08765-2-EFF-G

Sample#	R	AI	Gas #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
WAFOR-TDU-VQA.R2															
2181020000			10061-01-5	Isr-1,3-Dichloropentane	ng/g	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
2181020000			123-86-4	n-Butyl acetate	ng/g	76	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2181020000			142-82-5	n-Heptane	ng/g	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
2181020000			10061-02-8	trans-1,3-Dichloropentane	ng/g	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U

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 M - Not Analyzed, ND - Not Detected
 M - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-H
 Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	MF	Cal #	Analyte	Unit	SDS %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Col Eff %	Qual Flags
VAPOR-TDU/VQA (E)															
5161030501			75-34-5	1,1,2,2-Tetrachloroethane	ND5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
5161030501			75-00-5	1,1,2,2-Dichloroethane	ND5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
5161030501			75-34-3	1,1-Dichloroethane	ND5	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
5161030501			75-35-4	1,1-Dichloroethene	ND5	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
5161030501			103-66-3	1,3-Dichloroethane	ND5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161030501			543-75-8	1,3-Dichloropropane (Total)	ND5	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
5161030501			106-45-7	1,4-Dichlorobenzene	ND5	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a,U
5161030501			123-91-1	1,4-Dioxane	ND5	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
5161030501			71-30-3	1-Ethanol	ND5	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a,U
5161030501			111-70-8	1-Heptanol	ND5	91	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8		n/a,U
5161030501			71-23-8	1-Propanol	ND5	100	<3.0	13	n/a	n/a	n/a	n/a	3.0		n/a,U
5161030501			108-47-4	2,4-Dimethylpyridine	ND5	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1		n/a,U
5161030501			1708-29-8	2,5-Dihydrofuran	ND5	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
5161030501			78-03-3	2-Ethanol	ND5	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
5161030501			150-43-0	2-Heptanone	ND5	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
5161030501			591-78-8	2-Heptanone	ND5	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
5161030501			234-23-0	2-Methylfuran	ND5	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
5161030501			75-94-4	2-Buten-2-one	ND5	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
5161030501			106-36-4	2-Heptanone	ND5	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
5161030501			106-68-3	3-Octanone	ND5	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
5161030501			105-40-0	4-Methyl-2-pentanone	ND5	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
5161030501			108-15-1	4-Methyl-2-pentanone	ND5	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
5161030501			87-64-1	Acetone	ND5	86	<4.3	7.2	n/a	n/a	n/a	n/a	4.3		n/a,U
5161030501			75-05-8	Acetonitrile	ND5	94	<1.8	25	n/a	n/a	n/a	n/a	1.8		n/a,U
5161030501			98-86-2	Acetophenone	ND5	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
5161030501			107-13-1	Acrylonitrile	ND5	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
5161030501			107-18-6	Allyl Alcohol	ND5	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
5161030501			107-05-1	Allyl Chloride	ND5	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20161065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-H
 Customer Sample ID: 16-08765-2-EFF-H

Sample	R	AW	Cal #	Analyte	Unit	SPD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Con for % Qual Flags
VAPOR-TOU/VOA 82														
2161030501			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
2161030501			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
2161030501			123-73-8	Buflural	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
2161030501			166-14-9	Butanediol	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a
2161030501			56-23-3	Carbon tetrachloride	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
2161030501			87-46-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
2161030501			84-17-5	Ethanol	NGS	100	<1.4	100	n/a	n/a	n/a	n/a	7.4	n/a
2161030501			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			100-41-4	Ethylbenzene	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			110-00-9	Furan	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
2161030501			826-73-9	Heptanediol	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			126-99-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
2161030501			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a
2161030501			89-89-3	Nitrobenzene	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
2161030501			110-89-8	Pentamethyl	NGS	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			101-12-6	Propylbenzene	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
2161030501			115-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a
2161030501			100-42-5	Styrene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			127-18-4	Tetrachloroethene	NGS	100	<1.8	10	n/a	n/a	n/a	n/a	1.8	n/a
2161030501			198-48-3	Toluene	NGS	92	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			78-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
2161030501			75-09-4	Trichlorofluoromethane	NGS	110	<1.8	9.2	n/a	n/a	n/a	n/a	1.8	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDC Number:
 Customer Sample ID: 16-08765-2-EFF-H
 Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	AI	Gas #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Ret %	Det Limit	Conc Err %	Qual Flag
VAPOR: TDU VOA.HZ															
2187000501			1008	1-01-5	cis-1,3-Dichloropropene	NC25	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a/U
2187000501			123	08-4	n-Butyl acetate	NC25	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.4	n/a/U
2187000501			142	02-5	n-Heptane	NC25	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.4	n/a/U
2187000501			1008	1-02-6	trans-1,3-Dichloropropene	NC25	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SUG Number:
 Customer Sample ID: 16-08765-2-IN-A
 Customer Sample ID: 16-08765-2-IN-A

Sample #	AI	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
VAPOR: EDU VOA 12														
8161030502	79-34-5		1,1,1,3-Tetrachloroethane	MG25	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
8161030502	79-00-6		1,1,2-Trichloroethane	MG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
8161030502	75-34-3		1,1-Dichloroethane	MG25	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
8161030502	75-35-4		1,2-Dichloroethane	MG25	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
8161030502	107-26-2		1,2-Dichloroethane	MG25	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a,U
8161030502	540-75-6		1,3-Dichloropropane (Total)	MG25	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a,U
8161030502	199-46-7		1,4-Dichlorobenzene	MG25	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a,U
8161030502	123-91-1		1,4-Dioxane	MG25	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
8161030502	71-36-3		1-Butanol	MG25	140	<8.9	<8.9	n/a	n/a	n/a	n/a	n/a	8.9	n/a,Ta
8161030502	111-70-8		1-Heptanol	MG25	91	<3.6	<3.6	n/a	n/a	n/a	n/a	n/a	3.6	n/a,U
8161030502	71-23-8		1-Propanol	MG25	120	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a
8161030502	106-87-4		2,4-Dimethylpyridine	MG25	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a,U
8161030502	1708-20-8		2,5-Dihydrofuran	MG25	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
8161030502	78-83-3		2-Butanone	MG25	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
8161030502	116-43-0		2-Heptanone	MG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
8161030502	205-76-6		2-Hexanone	MG25	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
8161030502	534-33-0		2-Methylfuran	MG25	95	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a,U
8161030502	78-84-4		3-Buten-2-one	MG25	89	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
8161030502	106-38-4		3-Heptanone	MG25	90	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a,U
8161030502	199-69-3		3-Octanone	MG25	89	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a,U
8161030502	169-42-0		4-Methyl-2-hexanone	MG25	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a,U
8161030502	108-10-1		4-Methyl-2-pentanone	MG25	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a,U
8161030502	87-64-1		Acetone	MG25	89	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	4.3	n/a
8161030502	75-05-8		Acetonitrile	MG25	84	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
8161030502	89-86-2		Acetophenone	MG25	91	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U
8161030502	107-13-1		Acrylonitrile	MG25	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a,U
8161030502	107-18-6		Methyl Alcohol	MG25	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a,U
8161030502	107-05-1		Methyl Chloride	MG25	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDCS Number:
 Customer Sample ID: 16-08765-2-IN-A
 Customer Sample ID: 16-08765-2-IN-A

Sample#	E	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Ref Limit	Con Em %	Qual Flags
VIAFOR-TOU VOA162															
5167005002			71-43-2	Benzene	NG25	95	<1.2	2.8	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5167005002			100-47-0	Benzonitrile	NG25	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5167005002			123-73-8	Butanal	NG25	110	<2.1	5.2	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5167005002			109-74-0	Butanenitrile	NG25	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5167005002			54-23-5	Carbon tetrachloride	NG25	120	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			104-90-7	Chlorobenzene	NG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			75-05-3	Chloroethane	NG25	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5167005002			57-46-3	Chloroform	NG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			115-83-7	Cyclohexane	NG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			124-18-5	Decane	NG25	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5167005002			84-17-8	Ethanol	NG25	120	<7.4	29.0	n/a	n/a	n/a	n/a	7.4	n/a	n/a
5167005002			141-78-4	Ethyl acetate	NG25	82	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			100-41-4	Ethylbenzene	NG25	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			115-00-0	Hexane	NG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			110-54-3	Heptane	NG25	95	<1.7	1.5	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5167005002			826-73-8	Hexanenitrile	NG25	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			126-98-7	Methoxybenzene	NG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			75-09-2	Methylene Chloride	NG25	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5167005002			81-20-3	Naphthalene	NG25	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5167005002			58-62-3	Nitrobenzene	NG25	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5167005002			115-09-8	Pentanitrile	NG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			587-12-0	Propanenitrile	NG25	96	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	n/a
5167005002			115-86-1	Pyridine	NG25	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5167005002			100-42-5	Styrene	NG25	900	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			127-18-4	Tetrachloroethene	NG25	100	<1.8	34	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5167005002			108-88-3	Toluene	NG25	92	<1.5	8.3	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			79-01-5	Trichloroethene	NG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5167005002			75-68-4	Trichlorofluoromethane	NG25	110	<1.8	14	n/a	n/a	n/a	n/a	1.8	n/a	n/a

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 T - Tentatively Identified Compound
 NA - Not Analyzed, MD - Not Detected
 N - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-A
 Customer Sample ID: 16-08765-2-IN-A

Sample #	IS	MS	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Col Err %	Qual Flags
VAPOR-TDU/VOA #2															
21817030000			15061-01-9	Isi-1,3-Dichloropropane	YCS	100	<1.3	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
21817030000			123-88-4	n-Butyl acetate	YCS	76	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
21817030000			142-82-9	n-Heptane	YCS	92	<1.4	15	n/a	n/a	n/a	n/a	1.4		n/a
21817030000			15061-02-8	trans-1,3-Dichloropropane	YCS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

Y - Comment
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 U - Less Than Detection Limit
 T - Tentatively Identified Component
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 M - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163042
 SIDG Number:
 Customer Sample ID: 16-08765-2-IN-H
 Customer Sample ID: 16-08765-2-IN-H

Sample#	R	AI	Gas #	Analysis	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Eff %	Qual Flag
VAPOR: TOU VDA 82															
5187000603			79-34-5	1,1,2,2-Tetrachloroethane	NG25	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a/U
5187000603			79-00-5	1,1,2-Trichloroethane	NG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a/U
5187000603			79-34-3	1,1-Dichloroethane	NG25	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a/U
5187000603			75-35-4	1,1-Dichloroethene	NG25	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a/U
5187000603			107-06-2	1,3-Dichloroethane	NG25	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a/U
5187000603			942-79-8	1,3-Dichloropropene (Total)	NG25	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a/U
5187000603			106-46-7	1,4-Dichlorobenzene	NG25	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a/U
5187000603			123-91-1	1,4-Dioxane	NG25	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a/U
5187000603			71-36-3	1-Butanol	NG25	140	<8.9	300	n/a	n/a	n/a	n/a	n/a	8.9	n/a/Ya
5187000603			111-70-8	n-Heptanal	NG25	91	<5.8	<5.8	n/a	n/a	n/a	n/a	n/a	5.8	n/a/U
5187000603			71-42-8	n-Propanal	NG25	120	<3.0	30	n/a	n/a	n/a	n/a	n/a	3.0	n/a
5187000603			108-47-4	2,4-Dimethylpyridine	NG25	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a/U
5187000603			1708-20-8	2,5-Dihydrofuran	NG25	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a/U
5187000603			78-83-3	2-Butanone	NG25	94	<1.8	7.5	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
5187000603			110-43-0	2-Heptanone	NG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
5187000603			581-78-8	2-Hexanone	NG25	90	<1.2	1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a/U
5187000603			534-23-0	2-Methylfuran	NG25	94	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
5187000603			78-94-4	3-Ethyl-2-one	NG25	89	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a/U
5187000603			106-35-4	3-Heptanone	NG25	90	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a/U
5187000603			108-68-3	3-Octanone	NG25	89	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a/U
5187000603			90-42-0	4-Methyl-2-pentanone	NG25	90	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a/U
5187000603			108-10-1	4-Methyl-2-pentanone	NG25	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a/U
5187000603			87-64-1	Acetone	NG25	88	<4.3	26	n/a	n/a	n/a	n/a	n/a	4.3	n/a
5187000603			75-05-5	Acetonitrile	NG25	84	<1.8	27	n/a	n/a	n/a	n/a	n/a	1.8	n/a
5187000603			98-86-2	Acetophenone	NG25	91	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a/U
5187000603			997-13-1	Acrylonitrile	NG25	90	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a/U
5187000603			501-18-6	Methyl Alcohol	NG25	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a/U
5187000603			107-03-1	Methyl Chloride	NG25	89	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a/U

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 28163665
 BDC Number:
 Customer Sample ID: 16-08765-2-IN-H
 Customer Sample ID: 16-08765-2-IN-H

Sample#	R	MF	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Est Limit	Coll Eff %	Qual Flags
VAPOR:TDU VDA.IG															
5181030503			71-43-2	Benzene	MG25	95	<1.2	2.1	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030503			100-47-0	Benzonitrile	MG25	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030503			123-73-8	Butanal	MG25	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5181030503			109-74-0	Butanenitrile	MG25	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
5181030503			56-23-5	Carbon tetrachloride	MG25	120	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			198-90-7	Chlorobenzene	MG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			75-09-3	Chloroethane	MG25	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
5181030503			87-68-3	Chloroform	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			115-90-7	Cyclohexane	MG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			124-18-5	Decane	MG25	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030503			84-17-5	Ethanol	MG25	120	<7.8	200	n/a	n/a	n/a	n/a	7.8	n/a	n/a
5181030503			141-78-6	Ethyl acetate	MG25	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			100-41-4	Ethylbenzene	MG25	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			115-50-9	Furan	MG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			115-54-3	Hexane	MG25	95	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	n/a
5181030503			826-73-8	Hexanenitrile	MG25	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			129-88-7	Methoxybenzene	MG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			75-09-2	Methylene Chloride	MG25	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5181030503			81-20-3	Naphthalene	MG25	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5181030503			99-86-3	Nitrobenzene	MG25	97	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181030503			110-59-8	Permethrin	MG25	91	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			107-13-0	Propenenitrile	MG25	96	<1.8	2.0	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			110-86-1	Pyridine	MG25	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
5181030503			100-42-5	Styrene	MG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			127-18-4	Tetrahydrofuran	MG25	100	<1.8	4.5	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181030503			108-88-3	Toluene	MG25	97	<1.5	4.0	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			79-07-8	Trichloroethane	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181030503			75-69-4	Trichloroethene	MG25	110	<1.8	12	n/a	n/a	n/a	n/a	1.8	n/a	n/a

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 NA = Not Analyzed, ND = Not Detected
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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDS Number:
 Customer Sample ID: 16-00765-2-IN-H
 Customer Sample ID: 16-00765-2-IN-H

Sample #	K	M	Gas #	Analysis	Unit	SPD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Std Limit	Col Err %	Qual Flags
WVFOR:TQ1 VDA.B2															
2187000003			1000-1-01-5	cis-1,3-Dichloropropene	NGS	110	<1.2	<1.3	n/a	n/a	n/a	n/a	1.2	n/a	U
2187000003			122-88-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
2187000003			143-83-5	n-Heptane	NGS	90	<1.4	14	n/a	n/a	n/a	n/a	1.4	n/a	U
2187000003			1000-1-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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 L - LLS Outside Range

U - Less Than Detection Limit
 T - Tentatively Identified Compound

E - Outside Calibration Range
 J - Estimated

Y - Comment
 B - LCS Outside Range

Verification QC Analysis Comments
 Analysis: S161006049-000 Method: VAPOR-TDU VOA #2
 Matrix: VAPOR Replicate: 0
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Analysis: S1610110017-000 Method: VAPOR-TDU VOA #2
 Matrix: VAPOR Replicate: 0
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Analysis: S1610110018-000 Method: VAPOR-TDU VOA #2
 Matrix: VAPOR Replicate: 0
 Y = 1-BUTANOI MOL Failure
 Verification Sample Comments
 Sample: S161035494 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035495 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035496 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035497 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035498 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035499 Group: 20163065
 Y = 1-BUTANOI MOL Failure
 Sample: S161035500 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035501 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035502 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.
 Sample: S161035503 Group: 20163065
 Y = 1-BUTANOI Failed the SR criteria in the MOL study.

12/7/2016 2:13:12PM
 Cartridge Evaluation

VOA3.Comments

OSRComment 2.7.12
 OSR.JAR V. 3.0.12

07-Dec-2016 14:14:08
 DSRTCH-Labcopy 3.0.13
 DGR-JBR v. 3.0.12

Signature
 12/8/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065
 SDG Number:

Customer Sample ID: 16-08763-3-EFF-A
 Customer Sample ID: 16-08763-3-EFF-A

Sample	B	AB	GC Type	Sample	Cal. No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU/VOA 162									
216703494				Unknown-1	-	4.72	MG/S	34 JT	
216703494				Unknown-2	-	8.31	MG/S	150 JT	
216703494				Unknown-3	-	9.08	MG/S	26 JT	
216703494				Unknown	130-66-3	22.61	MG/S	27 JNT	
216703494				Unknown-4	-	24.32	MG/S	89 JT	
216703494				Dodecane	112-45-3	25.26	MG/S	12 JNT	
216703494				Benzo[hi]azole	65-18-9	26.33	MG/S	48 JNT	
216703494				Dodecane, 2,8,11-trimethyl-	31295-98-4	26.43	MG/S	94 JNT	
216703494				BLANK	-	28.05	MG/S	69	
216703494				Unknown-2	-	29.32	MG/S	94	

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07-Dec-2016 14:14:38
 DSR/Chemistry 3.0.13
 DSR-JSR v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 29163665

SDG Number:

Customer Sample ID: 16-08765-3-EFF-B

Customer Sample ID: 16-08765-3-EFF-B

Sample	B	AB	GC Type	Sample	Coll. No.	Retention Time (Minutes)	Unit	Result	Qual Flags
SFC06-TDU VDA 82									
216700495				Unknown-1	-	8.29	MG	150	JT
216700495				Unknown	138-86-3	22.81	MG	30	JRT
216700495				Unknown-2	-	24.22	MG	100	JT
216700495				Dodecane	113-69-3	25.25	MG	18	JRT
216700495				2-Propenoic acid, ethyl ester	2499-29-4	25.99	MG	30	JRT
216700495				Methanone	100-67-2	26.21	MG	15	JRT
216700495				Benzoic acid	65-10-9	26.33	MG	64	JRT
216700495				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.42	MG	28	JRT
216700495				2,2,4-trimethyl-1,3-pentanediol	6049-30-8	26.56	MG	85	JRT
216700495			BLWC	Unknown-1	-	28.05	MG	48	
216700495			BLWC	Unknown-2	-	28.22	MG	54	

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 F - Tentatively Identified Compound
 MA - Not Analyzed, MD - Not Detected
 M - Named TIC
 L - LLS Outside Range

07-Dec-2016 14:14:38
 DSRT-Technology 3.0.13
 DGR-JAR v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162065

SDG Number:

Customer Sample ID: 10-08763-3-EFF-C

Customer Sample ID: 10-08763-3-EFF-C

Sample	ID	Alt	GC Type	Sample	Calib No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TOU-VOL-07									
S167034-096				Unknown-1	-	8.28	MG5	115 JT	
S167034-096				Unknown	138-06-3	23.81	MG5	26 JNT	
S167034-096				Unknown-2	-	24.23	MG5	135 JT	
S167034-096				Dodecane	112-02-3	25.25	MG5	29 JNT	
S167034-096				Unknown-3	-	26.00	MG5	130 JT	
S167034-096				Methyamine	100-01-0	26.22	MG5	45 JNT	
S167034-096				Diethylacrole	55-18-9	26.34	MG5	84 JNT	
S167034-096				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.43	MG5	26 JNT	
S167034-096				2,2,4-trimethyl-1,3-pentanediol	6049-30-0	26.55	MG5	87 JNT	
S167034-096			BLNK	Unknown-1	-	28.05	MG5	45	
S167034-096			BLNK	Unknown-2	-	28.22	MG5	54	

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08763-3-EFF-D

Customer Sample ID: 16-08765-3-EFF-D

Sample	R	AB	GC Type	Sample	Cal No.	Retention Time (Minutes)	Unit	Result	Qual Flag
VAMPOR-TDU VOA.R2									
2187026487				Unknown-1	-	8.33	MGIS	209 JT	
2187026487				Unknown	138-66-3	22.67	MGIS	26 JNT	
2187026487				Unknown-2	-	34.22	MGIS	75 JT	
2187026487				Dodecane	113-49-3	25.26	MGIS	6.1 JNT	
2187026487				Methanamine	700-87-0	26.17	MGIS	25 JNT	
2187026487				Serofthiazole	66-16-9	26.33	MGIS	64 JNT	
2187026487				Dechlorane, 2,2,1-trimethyl-	31299-96-4	28.42	MGIS	16 JNT	
2187026487				Unknown-3	-	26.66	MGIS	39 JT	
2187026487			BLANK	Unknown-1	-	29.05	MGIS	46	
2187026487			BLANK	Unknown-2	-	29.32	MGIS	64	

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-E
 Customer Sample ID: 16-08765-3-EFF-E

Sample	ID	Alt	GC Type	Sample	CAE No.	Retention Time (minutes)	Unit	Result	Dual Flags
VAPOR-TDU NOA 12									
0167030408				Methyl formate	707-01-3	4.73	MG/S	44 JMT	
0167030408				Unknown-1	-	8.31	MG/S	260 JT	
0167030408				Unknown	138-06-3	22.61	MG/S	30 JMT	
0167030408				Unknown-2	-	34.33	MG/S	85 JT	
0167030408				Dodecane	113-00-3	25.25	MG/S	54 JMT	
0167030408				Methanamine	100-07-0	28.32	MG/S	85 JMT	
0167030408				BenzoicAcid	89-10-9	28.35	MG/S	69 JMT	
0167030408				Dodecane, 2,6,11-trimethyl-	31280-08-4	26.43	MG/S	23 JMT	
0167030408				Unknown-3	-	28.56	MG/S	44 JT	
0167030408			BLNK	Unknown-1	-	25.08	MG/S	46	
0167030408			BLNK	Unknown-2	-	25.32	MG/S	54	

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 NA = Not Analyzed, ND = Not Detected
 M - Mined TIC
 L - LIS Outside Range

07-Dec-2016 14:14:09
 DART-Chromcopy 3.0.13
 DSR_Jar v. 3.0.12

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163665

SDG Number:

Customer Sample ID: 16-08765-2-EFF-F

Customer Sample ID: 16-08765-2-EFF-F

Sample	R	Alt	GC Type	Sample	Std. Dev.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR: TDU VDA IS									
21671035-099				Methyl formate	107-31-3	4.72	MG25	95 JNT	
21671035-099				Unknown-1	-	8.31	MG25	300 JT	
21671035-099				Decane, 2,4,4-trimethyl-	52708-27-4	32.87	MG25	8.2 JNT	
21671035-099				Undecane	1120214	33.71	MG25	8.8 JNT	
21671035-099				Unknown-2	-	34.32	MG25	85 JT	
21671035-099				Dodecane	112-65-3	35.25	MG25	11 JNT	
21671035-099				Unknown-3	-	36.01	MG25	38 JT	
21671035-099				Methanamine	100-07-0	36.32	MG25	165 JNT	
21671035-099				Benzo[triazole]	96-16-9	36.35	MG25	49 JNT	
21671035-099				Dodecane, 4,8-dimethyl-	51141728	36.43	MG25	11 JNT	
21671035-099				Tetradecane	520594	37.01	MG25	7.8 JNT	
21671035-099			BLNK	Unknown-1	-	35.07	MG25	31	

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 DSRFIC-Inventory 3.0.13
 DSR_JAR v. 3.0.13

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-68765-3-EFF-G

Customer Sample ID: 16-68765-3-EFF-G

Sample	RI	Alt	Det Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR:TDU VQA 12									
21671035000				Methyl formate	123-31-3	4.73	MG/S	59 JMT	
21671035000				Unknown-1	-	8.28	MG/S	120 JT	
21671035000				Unknown-2	-	20.43	MG/S	75 JT	
21671035000				Unknown	136-86-3	22.81	MG/S	34 JMT	
21671035000				Unknown	1126-21-4	23.87	MG/S	86 JMT	
21671035000				Acetone, 2-methyl-	627-26-0	24.12	MG/S	34 JMT	
21671035000				Undecane, 4,7-dimethyl-	17387-32-5	23.83	MG/S	77 JMT	
21671035000				Undecane, 5,7-dimethyl-	17313-63-3	23.93	MG/S	32 JMT	
21671035000				Unknown-3	-	24.04	MG/S	26 JT	
21671035000				Unknown-4	-	24.22	MG/S	130 JT	
21671035000				Dodecane	112-40-3	24.25	MG/S	25 JMT	
21671035000				Methanamine	166-07-5	26.20	MG/S	200 JMT	
21671035000				Dodecane, 2,6,11-trimethyl-	31295-06-4	26.42	MG/S	28 JMT	
21671035000				Unknown-1	-	26.05	MG/S	48	
21671035000				Unknown-2	-	26.22	MG/S	54	

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDC Number:
 Customer Sample ID: 16-08765-3-EFF-H
 Customer Sample ID: 16-08765-3-EFF-H

Sample	R	Alt	GC Type	Analyte	Cal. No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR:TDU VDA B2									
2167035001				Methyl formate	107-31-3	4.73	MG/S	65	JNT
2167035001				Unknown-1	-	8.29	MG/S	140	JT
2167035001				Unknown-2	-	24.32	MG/S	54	JT
2167035001				Methanamine	100-97-0	24.32	MG/S	260	JNT
2167035001				Benzofuranone	26-16-8	28.34	MG/S	39	JNT
2167035001				Docosane, 2,6,11-trimethyl-	51285-56-4	28.43	MG/S	7.7	JNT
2167035001			BLNK	Unknown-1	-	25.65	MG/S	48	
2167035001			BLNK	Unknown-2	-	25.22	MG/S	54	

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 MA - Not Analyzed, MD - Not Detected
 N - Named TIC
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-A
 Customer Sample ID: 16-08765-2-IN-A

Sample ID	Ad	Od Type	Sample	Cell No.	Retention Time (minutes)	Unit	Result	Qual Flag
VAPOR:TDU VQA 02								
2147505002			Unknown-1	-	4.72	ug/g	190 JT	
2147505002			Unknown-2	-	8.29	ug/g	190 JT	
2147505002			Tetrahydrocannabinol	100-00-9	11.58	ug/g	26 JAT	
2147505002			N-Methylmethanamine	62-76-9	15.69	ug/g	26 JAT	
2147505002			Unknown-3	-	20.44	ug/g	27 JT	
2147505002			2-Limonene	989-27-5	22.61	ug/g	30 JAT	
2147505002			Unknown-4	-	24.23	ug/g	120 JT	
2147505002			Decane	112-42-3	25.25	ug/g	19 JAT	
2147505002			Methanamine	100-97-0	26.20	ug/g	300 JAT	
2147505002			Sarcosine	65-18-9	26.33	ug/g	45 JAT	
2147505002			Decane, 2,6,11-trimethyl-	31295-98-4	26.42	ug/g	19 JAT	
2147505002			Unknown-5	-	26.56	ug/g	37 JT	
2147505002	BLAK		Unknown-1	-	25.05	ug/g	46	
2147505002	BLAK		Unknown-2	-	25.22	ug/g	54	

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Cartridge Evaluation
 Data Summary Report

Sample Group: 26163665

SDG Number:

Customer Sample ID: 16-08765-2-IN-H

Customer Sample ID: 16-08765-2-IN-H

Sample	ID	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
MSDS: TDU VDA IS									
26163665				Methyl formate	107-31-3	4.72	MG/S	97 JKT	
26163665				Unknown-1	-	8.28	MG/S	100 JT	
26163665				Tetrahydrofuran	109-96-9	11.97	MG/S	17 JKT	
26163665				N,N-Dimethylmethanamine	80-75-9	15.89	MG/S	30 JKT	
26163665				Unknown-2	-	24.22	MG/S	53 JT	
26163665				Dodecane	112-65-3	29.25	MG/S	12 JKT	
26163665				Methanamine	100-97-0	28.21	MG/S	240 JKT	
26163665				Benzothiazole	95-18-9	28.34	MG/S	32 JKT	
26163665				Unknown-3	-	28.55	MG/S	97 JT	
26163665			MLWC	Unknown-1	-	28.05	MG/S	48	
26163665			MLWC	Unknown-2	-	28.22	MG/S	54	

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Quincy Jones
 11/28/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603068
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-A
 Customer Sample ID: 16-08766-3-EFF-A

Sample #	R	M	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Ref Limit	Conc %	Qual Flags
2161000000				VAPOR-TOU VOA.IG	NG05	110	<0.0	<0.0	n/a	n/a	n/a	n/a	3.0	n/a	U
2161000000			79-34-5	1,1,2,2-Tetrachloroethane	NG05	110	<0.3	<0.3	n/a	n/a	n/a	n/a	2.3	n/a	U
2161000000			79-02-5	1,1,3,3-Tetrachloroethane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
2161000000			79-34-3	1,1-Dichloroethane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
2161000000			79-35-4	1,1-Dichloroethane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
2161000000			107-06-2	1,3-Dichloroethane	NG05	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
2161000000			943-79-6	1,3-Dichloropropene (Total)	NG05	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
2161000000			506-46-7	1,4-Dichlorobenzene	NG05	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
2161000000			523-91-1	1,4-Dioxane	NG05	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
2161000000			71-36-3	1-Buland	NG05	100	<4.3	8.7	n/a	n/a	n/a	n/a	4.3	n/a	L
2161000000			111-79-6	1-Heptanol	NG05	100	<0.1	<0.1	n/a	n/a	n/a	n/a	0.1	n/a	U
2161000000			71-23-8	1-Propanol	NG05	100	<0.8	<0.8	n/a	n/a	n/a	n/a	0.8	n/a	U
2161000000			508-47-4	2,4-Dimethylpyridine	NG05	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
2161000000			1708-29-8	2,5-Dimethylurea	NG05	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
2161000000			78-83-3	2-Butanone	NG05	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
2161000000			110-43-0	2-Heptanone	NG05	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
2161000000			581-78-6	2-Heptanone	NG05	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
2161000000			504-23-5	2-Methylfuran	NG05	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
2161000000			78-94-4	2-Buten-2-one	NG05	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
2161000000			108-39-4	2-Heptanone	NG05	100	<2.7	4.6	n/a	n/a	n/a	n/a	2.7	n/a	U
2161000000			108-69-3	2-Octanone	NG05	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
2161000000			105-42-0	4-Methyl-2-pentanone	NG05	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
2161000000			108-10-1	4-Methyl-2-pentanone	NG05	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
2161000000			87-44-1	Acetone	NG05	97	<2.8	5.4	n/a	n/a	n/a	n/a	2.8	n/a	U
2161000000			78-06-8	Acetonitrile	NG05	100	<1.8	7.1E+03	n/a	n/a	n/a	n/a	1.8	n/a	Y
2161000000			88-96-2	Acetophenone	NG05	110	<0.2	<0.2	n/a	n/a	n/a	n/a	0.2	n/a	U
2161000000			107-13-1	Acrylonitrile	NG05	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
2161000000			107-18-6	Allyl Alcohol	NG05	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
2161000000			107-05-1	Allyl Chloride	NG05	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 201603068
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-A
 Customer Sample ID: 16-08766-2-EFF-A

Sample #	AI	Case #	Analyte	Unit	STD %	Blank	Result	Extricate	Average	RPD %	Spk Res %	Det Limit	Carrier %	Qual Flags
5181000500		71-43-2	Benzene	ug/L	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181000500		700-47-0	Benzonitrile	ug/L	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	n/a
5181000500		703-72-8	Butanal	ug/L	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5181000500		708-74-0	Butanenitrile	ug/L	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5181000500		746-23-6	Carbon tetrachloride	ug/L	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5181000500		768-90-7	Chlorobenzene	ug/L	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
5181000500		774-80-3	Chloroethane	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		774-80-3	Chloroform	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		774-80-3	Cyclohexane	ug/L	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
5181000500		784-18-0	Decane	ug/L	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5181000500		784-17-0	Ethanol	ug/L	110	<3.7	93	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5181000500		781-71-6	Ethyl acetate	ug/L	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		700-47-0	Ethylbenzene	ug/L	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5181000500		710-99-9	Formal	ug/L	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		710-94-3	Heptane	ug/L	100	<1.3	3.0	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5181000500		808-73-9	Hexanenitrile	ug/L	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
5181000500		728-98-7	Methacrylonitrile	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		781-69-2	Methylene Chloride	ug/L	100	<4.1	16	n/a	n/a	n/a	n/a	4.1	n/a	n/a
5181000500		81-20-3	Naphthalene	ug/L	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5181000500		84-95-3	Nitrobenzene	ug/L	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	n/a
5181000500		110-99-8	Nonanenitrile	ug/L	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
5181000500		107-12-0	Propenenitrile	ug/L	110	<1.8	3.2	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		110-95-1	Pyridine	ug/L	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5181000500		100-42-0	Styrene	ug/L	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5181000500		707-18-4	Tetrahydrofuran	ug/L	110	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		708-88-3	Toluene	ug/L	100	<2.2	3.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
5181000500		781-61-8	Trichloroethane	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5181000500		75-80-4	Trichloroethene	ug/L	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDO Number:
 Customer Sample ID: 16-08766-2-EFF-A
 Customer Sample ID: 16-08766-2-EFF-A

Sample	R	AI	Gas #	Analyte	Unit	RTD %	Blank	Result	Repeatab	Average	RPD %	Appl Bias %	Det Limit	Carrier %	Qual Flags
VMPOR-TDU VOA 02															
2167026500			10081-01-5	cis-1,3-Dichloropropene	KGUS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2167026500			123-06-4	n-Butyl acetate	KGUS	86	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
2167026500			142-00-5	n-Heptane	KGUS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
2167026500			10081-02-6	trans-1,3-Dichloropropene	KGUS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	J

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Cartridge Evaluation
 Data Summary Report

Sample Group: 30163049
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-B
 Customer Sample ID: 16-08766-2-EFF-B

Sample #	R	AI	CAS #	Analyte	Unit	SPG %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	See Limit	Get By	Qual Flag
1617020531			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U
1617020531			79-00-5	1,1,3-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a,U
1617020531			79-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
1617020531			79-35-4	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
1617020531			507-59-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
1617020531			840-75-6	1,3-Dichloropropane (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617020531			508-98-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a,U
1617020531			533-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a,U
1617020531			71-26-3	1-Butanol	NGS	120	<4.3	5.4	n/a	n/a	n/a	n/a	4.3		n/a,N
1617020531			111-70-6	1-Heptanol	NGS	110	<8.1	<8.1	n/a	n/a	n/a	n/a	8.1		n/a,U
1617020531			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a,U
1617020531			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a,U
1617020531			1799-29-8	2,5-Dihydrofuran	NGS	120	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a,U
1617020531			79-53-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1		n/a,U
1617020531			110-43-0	2-Heptanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1617020531			881-28-8	2-Heptanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U
1617020531			234-23-9	2-Methylbutan	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
1617020531			74-94-4	2-Buten-2-one	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
1617020531			106-30-4	3-Heptanone	NGS	100	<2.7	4.7	n/a	n/a	n/a	n/a	2.7		n/a,U
1617020531			106-69-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
1617020531			105-42-6	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
1617020531			108-10-1	4-Methyl-3-pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a,U
1617020531			87-86-1	Acetone	NGS	87	<2.6	19	n/a	n/a	n/a	n/a	2.6		n/a
1617020531			79-05-4	Acetonitrile	NGS	100	<1.6	49	n/a	n/a	n/a	n/a	1.6		n/a
1617020531			84-88-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2		n/a,U
1617020531			107-13-1	Amyl Alcohol	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a,U
1617020531			107-114-6	Amyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a,U
1617020531			107-69-1	Methyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U

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 L = LLQ Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603048
 SDCS Number:
 Customer Sample ID: 16-06766-2-EFF-B
 Customer Sample ID: 16-06766-2-EFF-B

Sample ID	AI	MSI	MSI #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Res %	Det Limit	Conc Err %	Qual Flag
1617000531			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
1617000531			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a,U
1617000531			123-72-8	Butanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U
1617000531			106-74-5	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a,U
1617000531			66-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
1617000531			106-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U
1617000531			75-50-3	Chloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			87-86-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			110-83-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
1617000531			144-11-9	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
1617000531			64-17-5	Ethanol	NGS	110	<3.7	25	n/a	n/a	n/a	n/a	3.7		n/a
1617000531			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
1617000531			119-00-9	Formal	NGS	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			119-54-3	Hexane	NGS	100	<1.3	2.2	n/a	n/a	n/a	n/a	1.3		n/a,U
1617000531			828-73-9	Heptanenitrile	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1617000531			129-98-7	Methoxybenzene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			75-08-2	Methylene Chloride	NGS	100	<4.1	9.5	n/a	n/a	n/a	n/a	4.1		n/a,U
1617000531			81-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a,U
1617000531			84-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a,U
1617000531			119-65-4	Propylbenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
1617000531			107-12-9	Propylbenzene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			119-65-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1617000531			100-42-5	Styrene	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a,U
1617000531			127-18-4	Tetrachloroethane	NGS	110	<1.8	16	n/a	n/a	n/a	n/a	1.8		n/a
1617000531			108-88-3	Toluene	NGS	100	<2.2	2.2	n/a	n/a	n/a	n/a	2.2		n/a,U
1617000531			74-81-6	Trichloroethene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1617000531			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDC Number:
 Customer Sample ID: 16-08766-2-EFF-B
 Customer Sample ID: 16-08766-2-EFF-B

Sample#	W	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Dev Limit	Con Err %	Qual Flag
WAPOR-TDU VQA.02															
016100001			10281-02-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
016100001			103-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
016100001			142-92-5	n-Heptane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
016100001			30091-02-8	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	J

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SUG Number:
 Customer Sample ID: 16-08766-2-EFF-C
 Customer Sample ID: 16-08766-2-EFF-C

Sample#	E	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD Bias %	Per Limit	Col Eff %	Std Flggs
161700532			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a
161700532			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	2.3	n/a
161700532			79-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
161700532			79-59-4	1,1-Dichloroethene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
161700532			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a
161700532			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a
161700532			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	4.1	n/a
161700532			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a
161700532			71-36-3	1-Butanol	NGS	100	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	4.3	n/a
161700532			111-76-6	1-Heptanol	NGS	110	<6.1	<6.1	n/a	n/a	n/a	n/a	n/a	6.1	n/a
161700532			71-23-8	1-Propanol	NGS	110	<6.9	<6.9	n/a	n/a	n/a	n/a	n/a	6.9	n/a
161700532			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	4.1	n/a
161700532			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	2.2	n/a
161700532			79-63-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	n/a	3.1	n/a
161700532			119-63-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a
161700532			261-78-6	2-Heptanone	NGS	100	<2.9	<2.9	n/a	n/a	n/a	n/a	n/a	2.9	n/a
161700532			504-33-9	2-Methylbutan	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a
161700532			78-94-4	2-Butan-2-one	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a
161700532			106-38-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a
161700532			109-69-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a
161700532			105-43-0	4-Methyl-2-heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a
161700532			106-10-1	4-Methyl-3-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	2.2	n/a
161700532			87-84-1	Acetone	NGS	97	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a
161700532			74-85-8	Acetonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a
161700532			96-46-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	n/a	6.2	n/a
161700532			107-13-1	Anisomethine	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a
161700532			107-114-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	2.3	n/a
161700532			167-05-1	Methyl Chloride	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	2.3	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 29162968
 SIDG Number:
 Customer Sample ID: 16-08766-2-EFF-C
 Customer Sample ID: 16-08766-3-EFF-C

Sample#	R	AI	Lab #	Analysis	Unit	SPS %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Eff %/Qual Flags
VAPOR:TDU VQA.E2														
S16T020532			71-43-2	Benzene	NG28	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a,U
S16T020532			100-47-0	Benzonitrile	NG28	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a,U
S16T020532			123-73-8	Butanal	NG28	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a,U
S16T020532			106-74-0	Butanenitrile	NG28	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a,U
S16T020532			24-23-5	Carbon tetrachloride	NG28	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a,U
S16T020532			104-90-7	Chlorobenzene	NG28	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a,U
S16T020532			79-09-3	Chloroethane	NG28	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			87-68-3	Chloroform	NG28	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			110-82-7	Cyclohexane	NG28	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a,U
S16T020532			224-18-5	Decane	NG28	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a,U
S16T020532			64-17-5	Ethanol	NG28	110	<3.7	4.3	n/a	n/a	n/a	n/a	3.7	n/a
S16T020532			541-78-8	Ethyl acetate	NG28	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			100-41-4	Ethylbenzene	NG28	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a,U
S16T020532			115-00-9	Furan	NG28	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			116-54-3	Heptane	NG28	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
S16T020532			838-73-9	Hexanenitrile	NG28	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
S16T020532			128-99-7	Methacrylonitrile	NG28	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			74-09-2	Methylene Chloride	NG28	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a,U
S16T020532			84-20-3	Naphthalene	NG28	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a,U
S16T020532			96-95-3	Nitrobenzene	NG28	520	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a,U
S16T020532			110-59-8	Permethrin	NG28	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
S16T020532			537-13-0	Propenitrile	NG28	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
S16T020532			110-89-1	Pyridine	NG28	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
S16T020532			100-42-5	Styrene	NG28	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a,U
S16T020532			127-18-4	Tetrahydrofuran	NG28	110	<1.8	20	n/a	n/a	n/a	n/a	1.8	n/a
S16T020532			106-86-3	Toluene	NG28	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a,U
S16T020532			79-01-4	Trichloroethane	NG28	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a,U
S16T020532			75-69-4	Trichloroethylene	NG28	110	<1.3	4.1	n/a	n/a	n/a	n/a	1.3	n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20161069
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-C
 Customer Sample ID: 16-08766-2-EFF-C

Sample #	SI	AI	CAI #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Con Err %	Qual Flags
VAPOR-TSU/VQA, 82															
2181020532			10061-01-8	cis-1,3-Dichloropropene	%CS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181020532			123-88-4	n-Butyl acetate	%CS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
2181020532			142-82-5	n-Hexane	%CS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
2181020532			70061-02-8	trans-1,3-Dichloropropene	%CS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-D
 Customer Sample ID: 16-08766-2-EFF-D

Sample#	E	M	CAS#	Analysis	Unit	STD %	Blank	Recover	Duplicate	Average	RPD %	Spk Rec %	Per Limit	Col Eff %/Qual Flag
1617020533			75-34-3	1,1,2,3-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a/U
1617020533			79-06-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a/U
1617020533			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
1617020533			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
1617020533			701-99-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a/U
1617020533			542-75-6	1,3-Dichloropropane (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
1617020533			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a/U
1617020533			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a/U
1617020533			71-36-3	1-Butanol	NGS	120	<4.3	6.4	n/a	n/a	n/a	n/a	4.3	n/a/L
1617020533			115-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a/U
1617020533			71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a/U
1617020533			508-47-4	2,4-Dimethylpyridine	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a/U
1617020533			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a/U
1617020533			79-83-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a/U
1617020533			110-43-0	2-Heptanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
1617020533			391-78-6	2-Heptanone	NGS	100	<2.9	<2.9	n/a	n/a	n/a	n/a	2.9	n/a/U
1617020533			504-23-5	2-Methylbutan	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a/U
1617020533			79-94-4	2-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a/U
1617020533			106-38-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a/U
1617020533			106-69-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a/U
1617020533			165-43-0	4-Methyl-2-heptanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
1617020533			108-10-1	4-Methyl-2-pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a/U
1617020533			97-84-1	Acetone	NGS	97	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a/U
1617020533			74-85-8	Acetonitrile	NGS	100	<1.8	62	n/a	n/a	n/a	n/a	1.8	n/a
1617020533			96-46-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a/U
1617020533			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a/U
1617020533			107-18-6	Methyl Alcohol	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a/U
1617020533			187-05-1	Methyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a/U

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 201610066
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-D
 Customer Sample ID: 16-08766-3-EFF-D

Sample #	SI	AI	CAS #	Analysis	Unit	RTD %	Blank	Result	Duplicate	Average	RP% %	Spk Rec %	Det Limit	Con Err %	Visual Flag
5161005033			71-43-2	Benzene	NG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5161005033			100-47-0	Benzonitrile	NG25	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	n/a
5161005033			123-73-8	Subtotal	NG25	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
5161005033			109-74-0	Methanol	NG25	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
5161005033			56-23-6	Carbon tetrachloride	NG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
5161005033			708-80-7	Chlorobenzene	NG25	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
5161005033			75-06-3	Chloroethane	NG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			87-86-3	Chloroform	NG25	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			110-82-7	Cyclohexane	NG25	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
5161005033			74-18-5	Decane	NG25	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
5161005033			84-17-6	Ethanol	NG25	100	<3.7	58	n/a	n/a	n/a	n/a	3.7	n/a	n/a
5161005033			541-78-8	Ethyl acetate	NG25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			100-41-4	Ethylbenzene	NG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
5161005033			116-00-8	Furan	NG25	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			119-54-3	Hexane	NG25	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
5161005033			828-75-8	Heptane	NG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5161005033			126-98-7	Hexamethylsiloxane	NG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			75-09-2	Methylene Chloride	NG25	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
5161005033			81-20-3	Naphthalene	NG25	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	n/a
5161005033			56-80-3	Nitrobenzene	NG25	100	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	n/a
5161005033			119-09-8	Permethrin	NG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5161005033			107-12-0	Propylene	NG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			152-86-1	Pyridine	NG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
5161005033			100-42-6	Styrene	NG25	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
5161005033			127-18-4	Tetrahydrofuran	NG25	100	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			108-83-3	Toluene	NG25	100	<2.2	2.6	n/a	n/a	n/a	n/a	2.2	n/a	n/a
5161005033			79-01-6	Trichloroethane	NG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
5161005033			75-68-4	Trichloroethylene	NG25	110	<1.9	5.4	n/a	n/a	n/a	n/a	1.9	n/a	n/a

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 Y - Comment
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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 S03 Number:
 Customer Sample ID: 16-08766-2-EFF-D
 Customer Sample ID: 16-08766-3-EFF-D

Sample#	R	AI	Lab #	Analyte	Unit	SPB %	Blank	Result	Duplicate	Average	RPD %	RPD Max %	Det Limit	Col Eff %	Qual Flag
VAPOR: TOU VOA 12															
8187000033			10081-01-3	cis-1,3-Dichloropropene	MG/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
8187000033			123-00-4	n-Butyl acetate	MG/L	86	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
8187000033			142-00-0	n-Hexane	MG/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
8187000033			10081-02-6	trans-1,3-Dichloropropene	MG/L	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	J

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 T - Tentatively Identified Compound
 M - Normal TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160303
 S03 Number:
 Customer Sample ID: 16-08766-2-EFF-E
 Customer Sample ID: 16-08766-2-EFF-E

Sample#	R	AI	Gas#	Analysis	Unit	SPD %	Bias%	Reprod	Duplicate	Average	SPD %	Spk Rec %	Det Limit	Carry-Over/Blank Flags
1617030304				VAPOR: TDU VOA 82										
1617030304				79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<-0.0	n/a	n/a	n/a	n/a	3.0	n/a,U
1617030304				79-00-5	1,1,2-Trichloroethane	NGS	110	<-2.3	n/a	n/a	n/a	n/a	2.3	n/a,U
1617030304				75-34-3	1,1-Dichloroethane	NGS	100	<1.7	n/a	n/a	n/a	n/a	1.7	n/a,U
1617030304				75-35-4	1,1-Dichloroethane	NGS	100	<1.7	n/a	n/a	n/a	n/a	1.7	n/a,U
1617030304				107-06-2	1,2-Dichloroethane	NGS	100	<1.7	n/a	n/a	n/a	n/a	1.7	n/a,U
1617030304				542-75-6	1,3-Dichloropropane (Total)	NGS	100	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
1617030304				506-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	n/a	n/a	n/a	n/a	4.1	n/a,U
1617030304				123-91-1	1,4-Dioxane	NGS	110	<-2.0	n/a	n/a	n/a	n/a	2.0	n/a,U
1617030304				71-36-3	1-Butanol	NGS	100	<4.3	n/a	n/a	n/a	n/a	4.3	n/a,U
1617030304				111-70-6	1-Propanol	NGS	110	<-0.1	n/a	n/a	n/a	n/a	0.1	n/a,U
1617030304				71-32-8	1-Propanol	NGS	110	<-8.9	n/a	n/a	n/a	n/a	8.9	n/a,U
1617030304				508-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	n/a	n/a	n/a	n/a	4.1	n/a,U
1617030304				1708-29-8	2,5-Dihydrofuran	NGS	130	<-2.2	n/a	n/a	n/a	n/a	2.2	n/a,U
1617030304				75-83-3	2-Butanone	NGS	100	<-3.1	n/a	n/a	n/a	n/a	3.1	n/a,U
1617030304				110-43-0	2-Heptanone	NGS	100	<-2.6	n/a	n/a	n/a	n/a	2.6	n/a,U
1617030304				581-76-6	2-Heptanone	NGS	100	<-2.5	n/a	n/a	n/a	n/a	2.5	n/a,U
1617030304				504-37-0	2-Methylbutan	NGS	100	<-1.3	n/a	n/a	n/a	n/a	1.3	n/a,U
1617030304				75-84-4	3-Butan-2-one	NGS	86	<1.9	n/a	n/a	n/a	n/a	1.9	n/a,U
1617030304				106-38-4	3-Heptanone	NGS	100	<-2.7	n/a	n/a	n/a	n/a	2.7	n/a,U
1617030304				106-69-3	3-Octanone	NGS	100	<-3.3	n/a	n/a	n/a	n/a	3.3	n/a,U
1617030304				105-43-0	4-Methyl-2-pentanone	NGS	100	<-2.6	n/a	n/a	n/a	n/a	2.6	n/a,U
1617030304				108-10-1	4-Methyl-2-pentanone	NGS	110	<-2.2	n/a	n/a	n/a	n/a	2.2	n/a,U
1617030304				87-84-1	Acetone	NGS	97	<-2.8	n/a	n/a	n/a	n/a	2.8	n/a,U
1617030304				75-05-8	Acetonitrile	NGS	100	<1.8	n/a	n/a	n/a	n/a	1.8	n/a,U
1617030304				84-85-2	Acetophenone	NGS	110	<-0.2	n/a	n/a	n/a	n/a	0.2	n/a,U
1617030304				107-13-1	Acrylonitrile	NGS	110	<-2.1	n/a	n/a	n/a	n/a	2.1	n/a,U
1617030304				107-18-6	Allyl Alcohol	NGS	120	<-3.3	n/a	n/a	n/a	n/a	3.3	n/a,U
1617030304				107-09-1	Allyl Chloride	NGS	110	<-2.5	n/a	n/a	n/a	n/a	2.5	n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 28163068
 SDG Number:
 Customer Sample ID: 16-08768-2-EFF-E
 Customer Sample ID: 16-08768-2-EFF-E

Sample #	E	M	Gas #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Con Err %	Qual Flag
VAPOR:TDU VOA.R2															
S161005034			71-43-2	Benzene	ug/g	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S161005034			700-47-0	Benzonitrile	ug/g	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	n/a
S161005034			123-72-8	Butanal	ug/g	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S161005034			106-74-6	Butanone	ug/g	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S161005034			26-23-5	Carbon tetrachloride	ug/g	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S161005034			108-90-7	Chlorobenzene	ug/g	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
S161005034			75-05-3	Chloroethane	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			87-68-3	Chloroform	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			115-93-7	Cyclohexane	ug/g	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S161005034			124-18-5	Decane	ug/g	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S161005034			84-17-5	Ethanol	ug/g	110	<3.7	4.1	n/a	n/a	n/a	n/a	3.7	n/a	n/a
S161005034			541-78-8	Ethyl acetate	ug/g	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			300-41-4	Ethylbenzene	ug/g	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S161005034			110-90-9	Furan	ug/g	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			110-54-3	Hexane	ug/g	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S161005034			628-73-9	Heptane	ug/g	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S161005034			128-99-7	Hexachlorobenzene	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			75-08-2	Methylene Chloride	ug/g	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S161005034			91-20-3	Naphthalene	ug/g	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	n/a
S161005034			96-65-3	Nitrobenzene	ug/g	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	n/a
S161005034			115-99-8	Permethrin	ug/g	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S161005034			167-13-0	Propylene Glycol	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			115-85-1	Pyridine	ug/g	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S161005034			100-40-3	Styrene	ug/g	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
S161005034			127-18-4	Tetrachloroethane	ug/g	110	<1.8	1.1	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S161005034			90-81-3	Toluene	ug/g	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S161005034			79-07-6	Trichloroethene	ug/g	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S161005034			71-49-4	Trichloroethylene	ug/g	110	<1.9	4.4	n/a	n/a	n/a	n/a	1.9	n/a	n/a

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 MA - Not Analyzed, ND = Not Detected
 L - U.S. Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-E
 Customer Sample ID: 16-08766-3-EFF-E

Sample #	Alt	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Cor Err %	Qual Flag
MSPQR: FOU VOA B2														
2187030304		10081-01-8	5a-1,3-Dichloropentane	MG5	116	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
2187030304		123-88-4	n-Butyl acetate	MG5	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
2187030304		142-80-6	n-Heptane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
2187030304		15061-02-8	3-methyl-3-pentene	MG5	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a/U

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 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LUS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160608
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-F
 Customer Sample ID: 16-08766-3-EFF-F

Sample #	S	M	Lab #	Analysis	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Err	Special Flags
1617000035				VAPOUR-TDU (VOCs E)											
1617000035			71-43-2	Benzene	MG25	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617000035			500-47-0	Benzonitrile	MG25	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	n/a
1617000035			525-73-8	Butanal	MG25	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
1617000035			109-74-6	Butanenitrile	MG25	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
1617000035			56-23-5	Carbon tetrachloride	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
1617000035			108-90-7	Chlorobenzene	MG25	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
1617000035			75-09-3	Chloroethane	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			87-68-3	Chloroform	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			119-85-7	Cylohexane	MG25	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
1617000035			124-18-5	Decane	MG25	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
1617000035			84-17-5	Ethanol	MG25	100	<3.7	8.1	n/a	n/a	n/a	n/a	3.7	n/a	n/a
1617000035			541-78-8	Ethyl acetate	MG25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			500-41-4	Ethylbenzene	MG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
1617000035			119-50-9	Furan	MG25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			110-54-3	Hexane	MG25	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617000035			626-73-8	Hexanenitrile	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000035			128-85-7	Methoxybenzene	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			75-09-3	Methylene Chloride	MG25	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
1617000035			81-80-3	Naphthalene	MG25	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	n/a
1617000035			56-85-3	Nitrobenzene	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000035			119-59-8	Permethrin	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000035			147-13-0	Propargolite	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000035			110-88-1	Pyridine	MG25	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
1617000035			100-42-5	Styrene	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			127-18-4	Tetrachloroethene	MG25	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
1617000035			766-88-3	Toluene	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			79-01-6	Trichloroethane	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000035			75-49-4	Trichloroethylene	MG25	110	<1.3	8.4	n/a	n/a	n/a	n/a	1.3	n/a	n/a

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 N - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 MA = Not Analyzed, ND = Not Detected
 L = U.S. Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 S00 Number:
 Customer Sample ID: 16-08766-2-EFF-F
 Customer Sample ID: 16-08766-2-EFF-F

Sample #	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spd Rec %	Det Limit	Std Err %/Qual Range
MFC08-TDU/VCA 02													
0187000035		10001-07-3	2,4,6-Trichlorophenoate	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
0187000035		123-85-4	n-Butyl acetate	ug/g	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a/U
0187000035		143-83-5	n-Heptane	ug/g	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
0187000035		10001-02-8	2,4,6-Trichlorophenoate	ug/g	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a/U

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 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160066
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-G
 Customer Sample ID: 16-08766-3-EFF-G

Sample#	E	MP	CAS #	Analyte	Unit	RT (M)	Blank	Result	Duplicate	Average	RP% %	Spot Rec %	Det Limit	Col Eff %	Visual Flags
1617000036				VAPOR-TDU (VOA.R)											
1617000036			79-34-3	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	
1617000036			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
1617000036			79-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
1617000036			79-34-4	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
1617000036			707-36-2	1,3-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
1617000036			343-79-6	1,3-Dichloropropane (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	
1617000036			106-66-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
1617000036			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	
1617000036			71-36-3	1-Butanol	NGS	100	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	
1617000036			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	
1617000036			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	
1617000036			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
1617000036			1268-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	
1617000036			78-83-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	
1617000036			110-43-0	2-Heptanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	
1617000036			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
1617000036			534-23-0	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	
1617000036			78-64-4	2-Buten-2-one	NGS	90	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	
1617000036			108-36-4	2-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
1617000036			108-66-3	2-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
1617000036			102-42-0	4-Methyl-2-pentanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	
1617000036			108-10-1	4-Methyl-2-pentanone	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
1617000036			67-44-1	Acetone	NGS	97	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a	
1617000036			75-05-8	Acetonitrile	NGS	100	<1.8	86	n/a	n/a	n/a	n/a	1.8	n/a	
1617000036			88-86-2	Acetophenone	NGS	110	<8.2	<8.2	n/a	n/a	n/a	n/a	8.2	n/a	
1617000036			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
1617000036			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
1617000036			107-05-1	Allyl Chloride	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162968
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-0
 Customer Sample ID: 16-08766-2-EFF-0

Sample#	#	AM	CAS#	Analyte	Unit	STD %	Blank	Recovery	Duplicate	Average	RPD %	Spk Bias %	Det Limit	Col Eff %/Qual Flag
S161020536			71-43-2	Benzene	ug/g	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a/U
S161020536			100-47-0	Benzonitrile	ug/g	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a/U
S161020536			123-72-8	Butanol	ug/g	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a/U
S161020536			100-74-0	Butanediol	ug/g	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a/U
S161020536			76-23-3	Carbon tetrachloride	ug/g	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a/U
S161020536			100-90-7	Chlorobenzene	ug/g	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a/U
S161020536			79-06-3	Chloroethane	ug/g	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			87-68-3	Chloroform	ug/g	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			110-82-7	Cyclohexane	ug/g	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a/U
S161020536			134-19-5	Cyclohexane	ug/g	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a/U
S161020536			94-17-5	Decane	ug/g	110	<3.7	82	n/a	n/a	n/a	n/a	3.7	n/a
S161020536			141-78-4	Diethyl acetylene	ug/g	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			100-41-4	Dihydrobenzene	ug/g	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a/U
S161020536			119-09-9	Furan	ug/g	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			152-54-3	Hexane	ug/g	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a/U
S161020536			828-73-0	Heptanediol	ug/g	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
S161020536			129-99-7	Methylacetylene	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			74-99-2	Methylene Chloride	ug/g	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a/U
S161020536			81-32-3	Naphthalene	ug/g	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a/U
S161020536			99-85-3	Nonane	ug/g	100	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a/U
S161020536			110-99-8	Octanediol	ug/g	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
S161020536			107-13-0	Propanediol	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			110-98-1	Pyridine	ug/g	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a/U
S161020536			105-40-5	Styrene	ug/g	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a/U
S161020536			127-18-4	Tetrahydrofuran	ug/g	110	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			108-98-3	Toluene	ug/g	100	<2.3	<2.2	n/a	n/a	n/a	n/a	2.2	n/a/U
S161020536			74-01-4	Trichloroethane	ug/g	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a/U
S161020536			71-49-4	Trichloroethane	ug/g	110	<1.8	5.8	n/a	n/a	n/a	n/a	1.8	n/a/U

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 J - Estimated
 T - Tentatively Identified Compound
 N - Name/ TIC
 U - Less Than Detection Limit
 Y - Comment
 MA - Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162868
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-G
 Customer Sample ID: 16-08766-2-EFF-G

Sample #	AI	CA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Max %	Det Limit	Car Bin %	Qual Flag
MUPOR TOU VOA 82														
218703536		10061-01-5	cis-1,3-Dichloropentane	MG5	116	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
218703536		103-88-4	n-Butyl acetate	MG5	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
218703536		143-82-9	n-Hexane	MG5	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
218703536		10061-02-6	trans-1,3-Dichloropentane	MG5	116	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a/U

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 H - Normal TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L = LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163968
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-H
 Customer Sample ID: 16-08766-2-EFF-H

Sample#	E	M	MS #	Analyte	Unit	SPD %	Blank	Result	Duplicates	Average	SPD Max %	Std Limit	Con Err %/Qual Flag
WAPOR TOU/VGA 82													
S161005537			75-34-5	1,1,2,2-Tetrachloroethane	ug/L	116	<0.0	<0.0	n/a	n/a	n/a	3.0	n/a,U
S161005537			75-00-5	1,1,2,2-Tetrachloroethane	ug/L	116	<0.3	<0.3	n/a	n/a	n/a	2.3	n/a,U
S161005537			75-34-3	1,1-Dichloroethane	ug/L	100	<1.7	<1.7	n/a	n/a	n/a	1.7	n/a,U
S161005537			75-35-4	1,1-Dichloroethane	ug/L	100	<1.7	<1.7	n/a	n/a	n/a	1.7	n/a,U
S161005537			707-26-2	1,2-Dichloroethane	ug/L	100	<1.7	<1.7	n/a	n/a	n/a	1.7	n/a,U
S161005537			542-75-6	1,3-Dichloropropane (Total)	ug/L	110	<1.8	<1.8	n/a	n/a	n/a	1.8	n/a,U
S161005537			508-46-7	1,4-Dichlorobenzene	ug/L	110	<4.1	<4.1	n/a	n/a	n/a	4.1	n/a,U
S161005537			123-91-1	1,4-Dioxane	ug/L	116	<2.0	<2.0	n/a	n/a	n/a	2.0	n/a,U
S161005537			71-36-3	1-Butanol	ug/L	100	<4.3	<4.3	n/a	n/a	n/a	4.3	n/a,U
S161005537			111-70-6	1-Heptanol	ug/L	110	<8.1	<8.1	n/a	n/a	n/a	8.1	n/a,U
S161005537			71-23-8	1-Propanol	ug/L	116	<8.9	<8.9	n/a	n/a	n/a	8.9	n/a,U
S161005537			108-47-4	2,4-Dimethylpyridine	ug/L	116	<4.1	<4.1	n/a	n/a	n/a	4.1	n/a,U
S161005537			1706-20-6	2,5-Dihydrofuran	ug/L	100	<2.2	<2.2	n/a	n/a	n/a	2.2	n/a,U
S161005537			75-82-3	2-Butanone	ug/L	100	<3.1	<3.1	n/a	n/a	n/a	3.1	n/a,U
S161005537			110-43-0	2-Heptanone	ug/L	100	<2.8	<2.8	n/a	n/a	n/a	2.8	n/a,U
S161005537			281-78-6	2-Heptanone	ug/L	100	<2.5	<2.5	n/a	n/a	n/a	2.5	n/a,U
S161005537			504-23-0	2-Methylfuran	ug/L	100	<1.3	<1.3	n/a	n/a	n/a	1.3	n/a,U
S161005537			78-84-4	2-Buten-2-one	ug/L	90	<1.9	<1.9	n/a	n/a	n/a	1.9	n/a,U
S161005537			108-38-4	3-Heptanone	ug/L	100	<2.7	<2.7	n/a	n/a	n/a	2.7	n/a,U
S161005537			108-69-3	3-Octanone	ug/L	100	<3.3	<3.3	n/a	n/a	n/a	3.3	n/a,U
S161005537			165-43-0	4-Methyl-2-pentanone	ug/L	100	<2.8	<2.8	n/a	n/a	n/a	2.8	n/a,U
S161005537			108-10-1	4-Methyl-2-pentanone	ug/L	110	<2.2	<2.2	n/a	n/a	n/a	2.2	n/a,U
S161005537			87-84-1	Acetone	ug/L	97	<2.8	<2.8	n/a	n/a	n/a	2.8	n/a,U
S161005537			75-05-8	Acetonitrile	ug/L	100	<1.8	<1.8	n/a	n/a	n/a	1.8	n/a
S161005537			84-86-2	Acetophenone	ug/L	110	<8.2	<8.2	n/a	n/a	n/a	8.2	n/a,U
S161005537			107-13-1	Acrylonitrile	ug/L	110	<2.1	<2.1	n/a	n/a	n/a	2.1	n/a,U
S161005537			107-18-6	Allyl Alcohol	ug/L	100	<2.3	<2.3	n/a	n/a	n/a	2.3	n/a,U
S161005537			107-09-1	Allyl Chloride	ug/L	110	<2.5	<2.5	n/a	n/a	n/a	2.5	n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 201610048
 SDG Number:
 Customer Sample ID: 16-08766-2-EFF-H
 Customer Sample ID: 16-08766-2-EFF-H

Sample #	E	M	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
1610200037			71-43-2	Benzene	MG5	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
1610200037			500-47-0	Benzonitrile	MG5	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a,U
1610200037			323-72-8	Buflural	MG5	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U
1610200037			106-74-8	Buacetonitrile	MG5	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a,U
1610200037			26-23-5	Carbon tetrachloride	MG5	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
1610200037			108-90-7	Chlorobenzene	MG5	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U
1610200037			78-08-3	Chloroethane	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			87-68-3	Chloroform	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			110-82-7	Cyclohexane	MG5	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
1610200037			324-78-5	Decane	MG5	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
1610200037			84-17-8	Ethanol	MG5	110	<3.7	76	n/a	n/a	n/a	n/a	3.7		n/a
1610200037			541-78-8	Ethyl acetate	MG5	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			100-41-4	Ethylbenzene	MG5	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
1610200037			119-00-9	Hexane	MG5	80	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			119-54-3	Heptane	MG5	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
1610200037			828-73-9	Hexanetriene	MG5	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1610200037			128-98-7	Methacrylonitrile	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			74-86-2	Methylene Chloride	MG5	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a,U
1610200037			81-20-3	Naphthalene	MG5	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a,U
1610200037			98-80-3	Nonane	MG5	500	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a,U
1610200037			110-13-0	Permethrin	MG5	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1610200037			119-86-1	Pyridine	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			100-42-5	Styrene	MG5	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
1610200037			137-18-4	Tetrahydrofuran	MG5	110	<1.3	8.0	n/a	n/a	n/a	n/a	1.3		n/a,U
1610200037			108-88-3	Toluene	MG5	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a,U
1610200037			78-01-4	Trichloroethene	MG5	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
1610200037			78-09-4	Tetrahydroethene	MG5	110	<1.3	8.0	n/a	n/a	n/a	n/a	1.3		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDO Number:
 Customer Sample ID: 16-08766-3-EFF-H
 Customer Sample ID: 16-08766-3-EFF-H

Sample #	Alt #	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spd Rec %	Test Limit	Con Br %	Qual Flag
01617020537			10001-01-3	mg/L	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
			123-00-4	mg/L	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a
01617020537			142-00-3	mg/L	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a
01617020537			20001-02-8	mg/L	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162068
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-A
 Customer Sample ID: 16-08766-2-IN-A

Sample #	S	AM	CA#	ANALYSIS	Unit	SPR %	BIAS	RECALL	DUPLICATE	AVERAGE	RPD %	SPR Bias %	Dev Limit	Col Eff %	Basal Flgth
VAPOR:TDU VOA IE															
161005538			71-43-2	Benzene	MG5	100	+1.5	3.0	NA	NA	NA	NA	1.5	NA	J
161005538			100-47-0	Benzonitrile	MG5	100	+4.2	-4.2	NA	NA	NA	NA	4.2	NA	J
161005538			123-73-0	Bisphenol	MG5	110	+3.0	-4.4	NA	NA	NA	NA	3.0	NA	J
161005538			100-74-0	Benzonitrile	MG5	110	+2.1	-2.1	NA	NA	NA	NA	2.1	NA	J
161005538			54-23-0	Carbon tetrachloride	MG5	110	+1.5	+1.5	NA	NA	NA	NA	1.5	NA	J
161005538			104-90-7	Chlorobenzene	MG5	110	+2.5	-2.5	NA	NA	NA	NA	2.5	NA	J
161005538			75-00-3	Chloroethane	MG5	110	+1.8	+1.8	NA	NA	NA	NA	1.8	NA	J
161005538			87-66-3	Chloroform	MG5	110	+1.8	+1.8	NA	NA	NA	NA	1.8	NA	J
161005538			119-80-7	Cyclohexane	MG5	110	+1.4	+1.4	NA	NA	NA	NA	1.4	NA	J
161005538			124-18-0	Decane	MG5	110	+3.3	-3.3	NA	NA	NA	NA	3.3	NA	J
161005538			84-17-0	Ethanol	MG5	110	+3.7	330	NA	NA	NA	NA	3.7	NA	J
161005538			84-17-0	Ethyl acetate	MG5	90	+1.8	+1.8	NA	NA	NA	NA	1.8	NA	J
161005538			300-41-4	Ethylbenzene	MG5	110	+2.4	-3.4	NA	NA	NA	NA	2.4	NA	J
161005538			110-00-0	Furan	MG5	80	+1.8	5.9	NA	NA	NA	NA	1.8	NA	J
161005538			110-54-3	Hexane	MG5	100	+1.3	21	NA	NA	NA	NA	1.3	NA	J
161005538			828-73-8	Hexanetriole	MG5	110	+2.8	-2.8	NA	NA	NA	NA	2.8	NA	J
161005538			128-98-7	Methoxybenzene	MG5	110	+1.8	+1.8	NA	NA	NA	NA	1.8	NA	J
161005538			71-09-2	Methylene Chloride	MG5	100	+4.1	+1.8	NA	NA	NA	NA	4.1	NA	J
161005538			81-20-3	Naphthalene	MG5	110	+5.3	-5.3	NA	NA	NA	NA	5.3	NA	J
161005538			56-05-3	Nonane	MG5	100	+4.7	+4.7	NA	NA	NA	NA	4.7	NA	J
161005538			110-00-0	Octane	MG5	110	+2.8	-2.8	NA	NA	NA	NA	2.8	NA	J
161005538			147-13-0	Propargolite	MG5	110	+1.8	2.8	NA	NA	NA	NA	1.8	NA	J
161005538			110-85-1	Pyridine	MG5	110	+2.7	4.7	NA	NA	NA	NA	2.7	NA	J
161005538			100-40-0	Styrene	MG5	110	+2.7	-2.7	NA	NA	NA	NA	2.7	NA	J
161005538			127-18-4	Tetrachloroethene	MG5	110	+1.8	7.8	NA	NA	NA	NA	1.8	NA	J
161005538			108-88-3	Toluene	MG5	100	+2.2	2.8	NA	NA	NA	NA	2.2	NA	J
161005538			79-01-0	Trichloroethane	MG5	110	+1.8	+1.8	NA	NA	NA	NA	1.8	NA	J
161005538			75-88-4	Trichloroethane	MG5	110	+1.8	1.8	NA	NA	NA	NA	1.8	NA	J

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163049
 BCG Number:
 Customer Sample ID: 16-08766-2-IN-A
 Customer Sample ID: 16-08766-2-IN-A

Sample #	AI	CAS #	Analyte	Unit	Std %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Per Limit	Out Err %	Qual Flags
SAPOR-TSU VQA 02														
211105038		10081-01-6	Isa-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
211105038		1273-00-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
211105038		142-02-3	n-Heptane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
211105038		50081-02-6	trans-1,3-Dichloropropene	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163008
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-H
 Customer Sample ID: 16-08766-2-IN-H

Sample #	AM	CAS#	Analyte	Unit	RTD-%	Blank	Result	Duplicate	Average	RPD %	Spk Max %	Det Limit	Car Bin %	Qual Flag
1617000039	100	79-34-5	1,1,2,2-Tetrachloroethane	NGS	116	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
1617000039	100	79-00-6	1,1,2-Trichloroethane	NGS	116	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a
1617000039	100	75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617000039	100	75-35-4	1,1-Chloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
1617000039	100	107-06-2	1,2-Dichloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000039	100	343-73-8	1,3-Dichloropropane (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000039	100	109-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
1617000039	100	123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
1617000039	100	71-36-3	1-Bromoethane	NGS	100	<4.3	280	n/a	n/a	n/a	n/a	4.3	n/a	n/a
1617000039	100	111-75-8	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a
1617000039	100	71-42-8	1-Propanol	NGS	110	<9.9	17	n/a	n/a	n/a	n/a	9.9	n/a	n/a
1617000039	100	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
1617000039	100	1768-29-8	2,5-Dihydrofuran	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a
1617000039	100	78-83-3	2-Butanone	NGS	100	<3.1	8.2	n/a	n/a	n/a	n/a	3.1	n/a	n/a
1617000039	100	119-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
1617000039	100	281-78-6	2-Heptanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
1617000039	100	504-33-0	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
1617000039	100	78-84-4	2-Buten-2-one	NGS	90	<1.8	9.5	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000039	100	108-30-4	2-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
1617000039	100	109-66-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
1617000039	100	109-42-0	4-Methyl-2-hexanone	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000039	100	108-50-1	4-Methyl-2-pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
1617000039	100	67-64-1	Acetone	NGS	97	<2.8	31	n/a	n/a	n/a	n/a	2.8	n/a	n/a
1617000039	100	75-05-8	Acetonitrile	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	n/a
1617000039	100	281-85-2	Acetophenone	NGS	110	<8.2	<8.2	n/a	n/a	n/a	n/a	8.2	n/a	n/a
1617000039	100	107-13-1	Benzonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
1617000039	100	107-18-6	Methyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a
1617000039	100	107-05-1	Methyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162868
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-41
 Customer Sample ID: 16-08766-2-IN-41

Sample #	AM	CAS#	Analyte	Unit	RTB-%	Blank	Result	Duplicate	Average	RPD %	Spk Rtn %	Dev Limit	Con Br %Qual Flag
S161005039		71-43-2	Benzene	MG25	100	<1.5	3.5	n/a	n/a	n/a	n/a	1.5	n/a
S161005039		100-47-0	Benzonitrile	MG25	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S161005039		123-72-8	Butanal	MG25	110	<3.8	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S161005039		100-74-0	Butanone	MG25	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S161005039		56-23-3	Carbon tetrachloride	MG25	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S161005039		108-90-7	Chlorobenzene	MG25	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S161005039		75-06-3	Chloroethane	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		87-68-3	Chloroform	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		110-82-7	Cyclohexane	MG25	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
S161005039		124-18-5	Decane	MG25	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S161005039		64-17-5	Ethanol	MG25	110	<3.7	180	n/a	n/a	n/a	n/a	3.7	n/a
S161005039		141-78-4	Ethyl acetate	MG25	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		100-41-4	Ethylbenzene	MG25	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S161005039		115-00-9	Fluorobenzene	MG25	100	<1.8	5.7	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		150-54-3	Hexane	MG25	100	<1.3	21	n/a	n/a	n/a	n/a	1.3	n/a
S161005039		628-73-9	Heptane	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
S161005039		106-90-7	Methacrylonitrile	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		75-09-2	Methylene Chloride	MG25	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S161005039		91-20-3	Naphthalene	MG25	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S161005039		96-89-3	Nitrobenzene	MG25	100	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
S161005039		110-59-8	Perchloroethylene	MG25	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a
S161005039		107-13-0	Propene	MG25	110	<1.8	2.3	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		115-86-1	Pyridine	MG25	110	<2.8	4.5	n/a	n/a	n/a	n/a	2.8	n/a
S161005039		100-40-3	Styrene	MG25	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S161005039		127-18-4	Tetrahydrofuran	MG25	110	<1.8	2.7	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		108-88-3	Toluene	MG25	100	<2.2	2.8	n/a	n/a	n/a	n/a	2.2	n/a
S161005039		34-01-4	Trichloroethane	MG25	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S161005039		75-49-4	Trichloroethylene	MG25	110	<1.9	13	n/a	n/a	n/a	n/a	1.9	n/a

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 M - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDC Number:
 Customer Sample ID: 16-08768-3-IN-H
 Customer Sample ID: 16-08768-3-IN-H

Sample #	MF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Car Err %	Qual Flags
1617000029		10001-01-3	Isop-1,3-Dichloropropane	MG/G	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000029		123-89-4	n-Butyl acetate	MG/G	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
1617000029		142-82-5	n-Heptane	MG/G	100	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	n/a
1617000029		10581-50-8	trans-1,3-Dichloropropane	MG/G	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 N - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

John Aug
 11/28/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-A

Customer Sample ID: 16-08766-3-EFF-A

Sample	R	AI	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flag
VMP/2R-1DU YCOA B2									
S-1617020500				Unknown-1	-	7.63	MG/G	190	JT
S-1617020500				2,2,3,7-Tetramethyl-octane	1671-31-4	21.43	MG/G	62	JNT
S-1617020500				Octane, 2,3,6,7-tetramethyl-	52870-34-5	22.06	MG/G	130	JNT
S-1617020500				Heptane, 2,2,4,6,6-pentamethyl	13479-82-6	22.60	MG/G	52	JNT
S-1617020500				Heptane, 4-ethyl-2,2,6,6-tetra	62106-31-0	22.67	MG/G	60	JNT
S-1617020500				Undecane, 3-methyl-	1600-43-3	23.02	MG/G	41	JNT
S-1617020500				Undecane, 2,6-dimethyl-	17201-28-4	23.39	MG/G	13	JNT
S-1617020500				Unknown-2	-	23.77	MG/G	68	JT
S-1617020500				Nonane, 2,6-dimethyl-	100-87-0	25.73	MG/G	34	JNT
S-1617020500				Benzoic acid	65-85-9	26.84	MG/G	91	JNT

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 N - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-B

Customer Sample ID: 16-08766-3-EFF-B

Sample #	Alt	GC Type	Sample	Carb. No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAMPOR-TDU VDA RT								
5181026531			Methyl Acetate	79-25-9	7.13	%GS	35.8MT	
5181026531			Unknown-1	-	7.87	%GS	219.7T	
5181026531			2,2,8-Trimethyl-Nonane	82016-28-8	18.88	%GS	59.8MT	
5181026531			2,2-Dimethyldecane	17303-37-3	21.48	%GS	79.8MT	
5181026531			Dodecane, 2,6,10-trimethyl-	3881-68-3	22.08	%GS	159.8MT	
5181026531			Decane, 2,4,6-trimethyl-	82168-27-4	22.45	%GS	32.8MT	
5181026531			Decane, 2,3,8-trimethyl-	82168-22-9	22.62	%GS	81.8MT	
5181026531			Octane, 3,6-dimethyl-	15669-94-0	22.68	%GS	69.8MT	
5181026531			Decane, 3,7-dimethyl-	17313-54-8	23.04	%GS	47.8MT	
5181026531			Heptane, 3,3-dimethyl-	4032-88-4	23.36	%GS	38.8MT	
5181026531			Unknown-2	-	23.78	%GS	48.7T	
5181026531			Methanamine	150-87-9	25.74	%GS	47.8MT	
5181026531			Benzothiazole	95-95-9	25.85	%GS	34.8MT	

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 N - Normal TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-C

Customer Sample ID: 16-08766-3-EFF-C

Sample #	Ad	GC Type	Analyte	Cal. No.	Retention Time (minutes)	Unit	Result	Qual Flags
VMPC25-TDU VQA.R2								
3187000032			Unknown-1	-	7.87	ug/g	279.7T	
3187000033			Unknown-2	-	23.89	ug/g	72.7T	
3187000034			Methamphetamine	100-87-0	25.76	ug/g	34.8AT	
3187000035			Benzofluoride	95-18-9	25.86	ug/g	87.8AT	
3187000036			Decane, 2,4,6-trimethyl-	82168-27-4	25.96	ug/g	19.8AT	

E - Outside Calibration Range
 J - Estimated

T - Tentatively Identified Compound
 N - Named TIC

U - Less Than Detection Limit
 Y - Comment

NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-0

Customer Sample ID: 16-08766-2-EFF-0

Sample #	IL	Ad	GC Type	Sample	CAI No.	Retention Time (Minutes)	Unit	Result	Qual Flag
WAPOR-TDU VOA.B2									
2187000530				Unknown-1	-	7.87	MG08	285 JT	
2187000530				Decane, 2,8,8-trimethyl-	52108-24-1	22.08	MG08	45 PNT	
2187000530				Benzoic acid, 2-(2-methyl-4)	52884-86-3	23.78	MG08	41 PNT	
2187000530				Methanamine	100-97-0	25.74	MG08	52 PNT	
2187000530				BenzoicAcid	90-10-9	26.85	MG08	28 PNT	

NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

U - Less Than Detection Limit
 Y - Comment

T - Tentatively Identified Compound
 N - Named TIC

E - Outside Calibration Range
 J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08766-2-EFF-E

Customer Sample ID: 16-08766-3-EFF-E

Sample	RI	AI	GC Type	Analyte	CAI No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TOU VQA.RT									
218700634				Unknown-1	-	7.87	%GS	269	JT
218700634				Benzoic acid, 2-(trimethylsilyl)	2189-85-3	23.85	%GS	30	JMT
218700634				Methanamine	700-87-0	25.75	%GS	76	JMT
218700634				Benzothiazole	95-18-0	25.86	%GS	38	JMT

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 J - Estimated
 T - Tentatively Identified Compound
 RI - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed, ND = Not Detected
 L - LLS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-F

Customer Sample ID: 16-08766-2-EFF-F

Sample#	R	Alt	SC Type	Sample	Cell No.	Retention Time (minutes)	Unit	Result	Qual Flag
WSPOR-TDU VDA.B2									
2187030535				Methyl Acetate	79-20-9	7.12	MG25	45.0NT	
2187030535				Unknown-1	-	7.87	MG25	275.0T	
2187030535				Unknown-2	-	23.78	MG25	47.0T	
2187030535				Decane, 2,4,6-trimethyl-	80199-27-4	24.84	MG25	13.0NT	
2187030535				Methanamine	100-97-0	25.74	MG25	120.0NT	
2187030535				BenzoicAcid	65-16-9	25.85	MG25	43.0NT	

E - Outside Calibration Range
 J - Estimated
 T - Tentatively Identified Compound
 N - Named TIC
 U - Less Than Detection Limit
 Y - Comment
 NA = Not Analyzed; ND = Not Detected
 L - LUS Outside Range

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-3-EFF-G

Customer Sample ID: 16-08766-3-EFF-G

Sample#	E	M	GC Type	Analyte	Cal# No.	Retention Time (Minutes)	Unit	Result	Qual Flag
WAPOR-TDU VOA.i2									
0161030536				Methyl Acetate	79-20-0	7.12	MG08	45	JWT
0161030536				Unknown-1	-	7.86	MG08	255	JT
0161030536				Cyclohexanone, octamethyl	509-47-2	19.88	MG08	52	JWT
0161030536				2,6-Dimethylpiperone	13190-81-7	22.43	MG08	47	JWT
0161030536				Decane, 2,4,6-trimethyl-	82108-37-4	23.60	MG08	18	JWT
0161030536				Undecane, 5,7-dimethyl-	17212-83-3	23.37	MG08	38	JWT
0161030536				Undecane, 4,7-dimethyl-	17201-32-0	23.48	MG08	25	JWT
0161030536				Unknown-2	-	23.79	MG08	80	JT
0161030536				Methoxybenzene	100-81-0	26.74	MG08	260	JWT

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Cartridge Evaluation
 Data Summary Report

Sample Group: 26163668

SDG Number:

Customer Sample ID: 16-08766-2-EFF-H

Customer Sample ID: 16-08766-2-EFF-H

Sample #	B	AI	SC Type	Sample	Cartridge	Retention Time (minutes)	Unit	Result	Qual Flags
SWPCN-TDU VOA.R3									
2187035537				Unknown-1	-	7.85	MG25	266 JT	
2187035537				Unknown-2	-	23.79	MG25	28 JT	
2187035537				Methamine	100-82-9	26.74	MG25	219 JNT	
2187035537				1,2-Dibromoethane	373-16-2	26.85	MG25	31 JNT	

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Cartridge Evaluation
 Data Summary Report

Sample Group: 26163668

SDG Number:

Customer Sample ID: 16-08766-2-JN-A

Customer Sample ID: 16-08766-2-JN-A

Sample	BI	AI	GC Type	Acqfile	Call No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TOU VOA 162									
2147026638				Formamide	75-12-7	5.87	UGS	54	INT
2147026638				Methyl Acetate	79-20-9	7.13	UGS	54	INT
2147026638				Unknown-1	-	7.86	UGS	126	JT
2147026638				Tetrahydrofuran	109-99-9	11.64	UGS	27	INT
2147026638				Hexane, 3-methyl-	269-34-4	14.14	UGS	28	INT
2147026638				Cyclohexane, 1-methyl-4-(1-methyl-2-propenyl)-	1467-27-4	21.88	UGS	32	INT
2147026638				Unknown-2	-	23.79	UGS	86	JT
2147026638				Carbonic acid, butyryl-, p	34644-61-0	25.39	UGS	33	INT
2147026638				Benzofuran	95-16-9	25.86	UGS	79	INT
2147026638				Decane, 2,4,6-trimethyl-	62108-27-4	25.98	UGS	30	INT
2147026638				Hydroquinone, O-ethyl-	26812-78-1	28.10	UGS	32	INT

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163068
 SDG Number:
 Customer Sample ID: 16-08766-2-IN-H
 Customer Sample ID: 16-08766-2-IN-H

Sample #	Ad	Od Type	Analyte	Call No.	Retention Time (minutes)	Unit	Amount	Qual Flags
VAPORES: TDSU VOA RT								
2147026639			Unknown-1	-	7.86	ug/g	190 JT	
2147026639			Tetrahydrocannabinol	709-89-9	11.62	ug/g	31 JNT	
2147026639			Formamide	75-12-7	13.74	ug/g	31 JNT	
2147026639			Unknown-2	-	23.79	ug/g	35 JT	
2147026639			Methamphetamine	700-87-6	25.74	ug/g	160 JNT	
2147026639			Benzo(a)pyrene	95-18-9	25.85	ug/g	41 JNT	

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Cartridge Evaluation
 Data Summary Report

*Open Entry
 11/22/16*

Sample Group: 28163061
 SDG Number:
 Customer Sample ID: 16-68765-3-BASE-EFF
 Customer Sample ID: 16-68765-3-BASE-EFF

Sample	R	AI	CAI	Unit	Analyte	RTD %	Mass	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Car Eff %	Qual Flag
Furans in Vapor Samples by SIM															
5181030309				1191-66-7	2,3-Dihydrofuran	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
5181030309				1708-28-8	2,4-Dihydrofuran	112	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
5181030309				625-66-5	2,3-Dimethylfuran	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
5181030309				3777-71-7	2-Hydrofuran	92	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
5181030309				534-23-5	3-Methylfuran	82	<0.15	0.16	n/a	n/a	n/a	n/a	0.15	n/a	U
5181030309				3777-69-3	2-Furylfuran	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
5181030309				4279-81-8	2-Propylfuran	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
5181030309				110-00-9	Furan	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
5181030309				759-98-9	Tetrahydrofuran	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDC Number:
 Customer Sample ID: 16-08765-3-BASE-IN
 Customer Sample ID: 16-08765-3-BASE-IN

Sample	R	MP	CAS #	Analyte	Unit	STD %	Blank	Result	Supstrate	Average	RFD %	Spk Rec %	Det Limit	Col Eff %	Qual Flags
Furans in Vapor Samples by SDC															
2181030360			1181-89-7	2,3-Dihydrofuran	%OS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
2181030360			1158-29-8	2,5-Dihydrofuran	%OS	114	<0.45	0.49	n/a	n/a	n/a	n/a	0.45	n/a	U
2181030360			825-66-5	2,5-Dimethylfuran	%OS	86	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
2181030360			3771-71-7	2-Heptylfuran	%OS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
2181030360			534-52-5	2-Methylfuran	%OS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
2181030360			3771-89-3	2-Propylfuran	%OS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
2181030360			4229-91-8	2-Propylfuran	%OS	90	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U
2181030360			119-60-9	Furan	%OS	505	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
2181030360			109-99-9	Tetrahydrofuran	%OS	500	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

MA = Not Analyzed, ND = Not Detected

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U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161061
 SDG Number:
 Customer Sample ID: 16-68765-3-BLANK1
 Customer Sample ID: 16-68765-3-BLANK1

Sample#	R	MF	Cell#	Analyte	Unit	STD %	Blank	Result	Suppluate	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flags
Puraria in Vapor Samples by SDG															
2187035261			1194-69-7	2,3-Dihydrofuran	%OS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
2187035261			1708-29-8	2,4-Dihydrofuran	%OS	115	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
2187035261			205-86-5	2,5-Dimethylfuran	%OS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
2187035261			3177-71-7	2-Heptylfuran	%OS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
2187035261			534-22-5	2-Methylfuran	%OS	92	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
2187035261			2777-69-3	2-Pentylfuran	%OS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
2187035261			4229-91-8	2-Propylfuran	%OS	95	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
2187035261			110-00-9	Furan	%OS	500	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
2187035261			703-69-9	Tetrahydrofuran	%OS	500	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162061
 SDG Number:
 Customer Sample ID: 16-08765-3-BLANK2
 Customer Sample ID: 16-08765-3-BLANK2

Sample#	R	MP	GA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spot Rec %	Det Limit	Conc Err %	Qual Flags
Purms in Vapor Samples by SDG															
2187035362			1191-99-7	2,3-Dihydrofuran	ug/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
2187035362			1708-29-8	2,5-Dihydrofuran	ug/S	115	<0.45	0.85	n/a	n/a	n/a	n/a	0.45		n/a/J
2187035362			825-86-5	2,4-Dimethylfuran	ug/S	85	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
2187035362			3777-91-7	2-Heptylfuran	ug/S	95	<0.36	0.32	n/a	n/a	n/a	n/a	0.36		n/a/J
2187035362			534-22-8	2-Methylfuran	ug/S	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
2187035362			2777-69-3	2-Propylfuran	ug/S	91	<0.29	0.41	n/a	n/a	n/a	n/a	0.29		n/a/J
2187035362			4229-91-8	2-Propylfuran	ug/S	95	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
2187035362			710-00-8	Furan	ug/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
2187035362			109-99-9	Tetrahydrofuran	ug/S	100	<0.31	0.64	n/a	n/a	n/a	n/a	0.31		n/a/J

MA = Not Analyzed, ND = Not Detected

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-A
 Customer Sample ID: 16-08765-3-EFF-A

Sample #	Alt	Case #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	BPO %	Split Rec %	Det Limit	Cost Per % Quad Stage
Purans in Vapor Samples by Solid													
518703063		1181-09-7	2,3-Dihydrofuran	MG5	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a/U
518703063		1108-29-8	2,3-Dihydrofuran	MG5	112	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a/U
518703063		825-89-5	2,4-Dimethylfuran	MG5	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a/U
518703063		3177-71-7	2-Heptofuran	MG5	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a/U
518703063		534-22-5	2-Methylfuran	MG5	94	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a/U
518703063		3177-69-3	2-Pentylfuran	MG5	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a/U
518703063		4229-91-8	2-Propylfuran	MG5	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a/U
518703063		119-00-9	Furan	MG5	102	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a/U
518703063		109-09-9	Tetrahydrofuran	MG5	102	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a/U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-B
 Customer Sample ID: 16-08765-3-EFF-B

Sample	R	MF	CAI#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
Purata in Vapor Samples by SDG															
2187035364			1994-09-7	2,3-Dihydrofuran	ngOS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
2187035364			1708-20-8	2,5-Dihydrofuran	ngOS	102	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
2187035364			825-86-5	2,5-Dimethylfuran	ngOS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
2187035364			3777-71-7	2-Heptylfuran	ngOS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
2187035364			634-22-6	2-Methylfuran	ngOS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
2187035364			2777-69-3	2-Pentylfuran	ngOS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
2187035364			4229-91-8	2-Propylfuran	ngOS	95	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
2187035364			119-03-9	Furan	ngOS	102	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
2187035364			109-09-9	Tetrahydrofuran	ngOS	102	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

NA = Not Analyzed, ND = Not Detected

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-C
 Customer Sample ID: 16-08765-3-EFF-C

Sample#	S	M	Cal#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Sgt Bias %	Det Limit	Con Est %	Qual Flags
Fluents in Vapor Samples by Site															
2187035365			1191-09-7	2,3-Dihydrofuran	MG/S	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
2187035365			1708-29-8	2,5-Dihydrofuran	MG/S	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
2187035365			825-66-5	2,5-Dimethylfuran	MG/S	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
2187035365			3177-71-7	2-Hexylfuran	MG/S	95	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36		n/a/U
2187035365			834-32-5	2-Methylfuran	MG/S	92	<0.15	0.31	n/a	n/a	n/a	n/a	0.15		n/a/J
2187035365			2177-69-3	2-Phenylfuran	MG/S	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
2187035365			4028-91-8	2-Propylfuran	MG/S	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
2187035365			119-00-9	Furan	MG/S	100	<0.56	<0.56	n/a	n/a	n/a	n/a	0.56		n/a/U
2187035365			109-99-9	Tetrahydrofuran	MG/S	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-0
 Customer Sample ID: 16-08765-3-EFF-0

Sample	R	AI	Cal #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spd Rec %	Det Limit	Col Err %	Qual Flags
Furans in Vapor Samples by SdG															
2187030368			1134-09-7	2,3-Dihydrofuran	ug/g	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a,U
2187030368			1798-29-8	2,5-Dihydrofuran	ug/g	112	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a,U
2187030368			825-86-5	2,5-Dimethylfuran	ug/g	89	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a,U
2187030368			2177-71-7	2-Heptylfuran	ug/g	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a,U
2187030368			834-32-8	2-Methylfuran	ug/g	85	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a,U
2187030368			2177-69-3	2-Pentylfuran	ug/g	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a,U
2187030368			4229-91-8	2-Propylfuran	ug/g	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a,U
2187030368			110-05-8	Furan	ug/g	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a,U
2187030368			209-89-9	Tetrahydrofuran	ug/g	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a,U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDC Number:
 Customer Sample ID: 16-08765-3-EFF-4
 Customer Sample ID: 16-08765-3-EFF-4

Sample#	R	AI	Cal#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Std Limit	Corr %	Qual Flags
Furans in Vapor Samples by SDC															
S16T005367			1184-09-7	2,3-Dihydrofuran	%OS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T005367			1708-29-8	2,5-Dihydrofuran	%OS	112	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T005367			605-69-5	2,3-Dimethylfuran	%OS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T005367			3777-71-7	3-Heptylfuran	%OS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T005367			534-23-5	2-Methylfuran	%OS	94	<0.19	<0.19	n/a	n/a	n/a	n/a	0.19		n/a/U
S16T005367			3777-69-3	2-Pentylfuran	%OS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T005367			4229-91-8	2-Propylfuran	%OS	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T005367			110-00-8	Furan	%OS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T005367			109-99-9	Tetrahydrofuran	%OS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 26163961
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-F
 Customer Sample ID: 16-08765-3-EFF-F

Sample#	R	MP	GA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Car Err %	Qual Flags
Purified in Vapor Samples by SDG															
2187035368			1994-89-7	2,3-Dihydrofuran	%OS	95	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
2187035368			1708-29-8	2,5-Dihydrofuran	%OS	95	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
2187035368			825-86-5	2,5-Dimethylfuran	%OS	89	<0.28	<0.28	n/a	n/a	n/a	n/a	0.28		n/a/U
2187035368			3171-91-7	2-Heptylfuran	%OS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
2187035368			534-22-5	2-Methylfuran	%OS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
2187035368			2777-69-3	2-Phenylfuran	%OS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
2187035368			4229-91-8	2-Propylfuran	%OS	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
2187035368			110-00-9	Furan	%OS	95	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
2187035368			100-89-9	Tetrahydrofuran	%OS	95	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-G
 Customer Sample ID: 16-08765-3-EFF-G

Sample #	MF	Case #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc Error	Quant Flags
Purans in Vapor Samples by Solid														
S187000069		1181-09-7	2,3-Dihydrofuran	ng/g	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	n/a
S187000069		1706-29-8	2,3-Dihydrofuran	ng/g	112	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	n/a
S187000069		625-66-5	2,3-Dimethylfuran	ng/g	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	n/a
S187000069		2777-71-7	2-Heptifuran	ng/g	95	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36	n/a	n/a
S187000069		534-23-5	2-Methylfuran	ng/g	82	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	n/a
S187000069		2777-69-3	2-Pentylfuran	ng/g	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	n/a
S187000069		4229-91-8	2-Propylfuran	ng/g	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	n/a
S187000069		119-00-9	Furan	ng/g	102	<0.98	<0.98	n/a	n/a	n/a	n/a	0.98	n/a	n/a
S187000069		100-66-9	Tetrahydrofuran	ng/g	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20161061
 SDG Number:
 Customer Sample ID: 16-08765-3-EFF-H
 Customer Sample ID: 16-08763-3-EFF-H

Sample #	Alt	Cartridge	Analyte	Unit	RTS %	Blank	Result	Duplicate	Average	SD% N	Spk Res %	Det Limit	Corr Err %	Qual Flag
Furans in Vapor Samples by Solid														
SI-671005370		1181-09-7	2,3-Dihydrofuran	MG/G	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	n/a
SI-671005370		1108-29-8	2,3-Dihydrofuran	MG/G	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	n/a
SI-671005370		825-84-5	2,4-Dimethylfuran	MG/G	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	n/a
SI-671005370		3177-71-7	2-Heptylfuran	MG/G	90	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36	n/a	n/a
SI-671005370		534-22-6	2-Methylfuran	MG/G	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	n/a
SI-671005370		3177-49-3	2-Propylfuran	MG/G	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	n/a
SI-671005370		4029-91-8	2-Propylfuran	MG/G	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	n/a
SI-671005370		118-09-9	Furan	MG/G	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	n/a
SI-671005370		109-09-9	Tetrahydrofuran	MG/G	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 28163061
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-A
 Customer Sample ID: 16-08765-3-IN-A

Sample #	R	AI	CAI #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Car Err %	Qual Flags
Furans in Vapor Samples by SIM															
28167035371			1191-05-7	2,3-Dihydrofuran	ng/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
28167035371			1708-28-8	2,4-Dihydrofuran	ng/S	152	<0.45	0.75	n/a	n/a	n/a	n/a	0.45		n/a J
28167035371			293-88-5	2,5-Dimethylfuran	ng/S	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
28167035371			377-71-7	2-Hydrofuran	ng/S	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
28167035371			594-23-3	2-Methylfuran	ng/S	94	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
28167035371			377-48-3	2-Pentylfuran	ng/S	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
28167035371			4229-81-8	2-Propylfuran	ng/S	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
28167035371			155-55-9	Furan	ng/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
28167035371			703-88-9	Tetrahydrofuran	ng/S	100	<0.31	27	n/a	n/a	n/a	n/a	0.31		n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20160061
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-8
 Customer Sample ID: 16-08765-3-IN-8

Sample #	Ref	CAS #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Bar %	Qual Flag
Furans in Vapor Samples by SDG														
S-167035372		1191-99-7	2,3-Dihydrofuran	ug/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	J
S-167035372		1706-29-8	2,3-Dihydrofuran	ug/S	100	<0.45	1.2	n/a	n/a	n/a	n/a	0.45	n/a	J
S-167035372		625-86-5	2,3-Dimethylfuran	ug/S	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	J
S-167035372		3771-71-7	2-Heptylfuran	ug/S	92	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	J
S-167035372		694-23-5	2-Methylfuran	ug/S	95	<0.13	0.15	n/a	n/a	n/a	n/a	0.13	n/a	J
S-167035372		3777-99-3	2-Pentylfuran	ug/S	91	<0.29	0.69	n/a	n/a	n/a	n/a	0.29	n/a	J
S-167035372		4229-81-8	2-Propylfuran	ug/S	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	J
S-167035372		110-00-9	Furan	ug/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	J
S-167035372		109-99-9	Tetrahydrofuran	ug/S	100	<0.31	0.6	n/a	n/a	n/a	n/a	0.31	n/a	J

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Cartridge Evaluation
 Data Summary Report

Sample Group: 26163061
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-C
 Customer Sample ID: 16-08765-3-IN-C

Sample #	R	Adj	CAI #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RSD %	Std Res %	Det Limit	Con Est %	Qual Flag
Furans In Vapor Samples by SDG															
S161005373			1161-06-7	2,3-Dihydrofuran	MG26	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a
S161005373			1706-26-8	2,4-Dihydrofuran	MG26	115	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a
S161005373			305-66-5	2,5-Dimethylfuran	MG26	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a
S161005373			3777-71-7	2-Heptylfuran	MG26	95	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36		n/a
S161005373			534-23-3	2-Methylfuran	MG26	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a
S161005373			3777-69-3	2-Propylfuran	MG26	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a
S161005373			4229-91-8	2-Propylfuran	MG26	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a
S161005373			116-00-9	Furan	MG26	100	<0.95	<0.95	n/a	n/a	n/a	n/a	0.95		n/a
S161005373			100-99-9	Tetrahydrofuran	MG26	100	<0.31	21	n/a	n/a	n/a	n/a	0.31		n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-0N-D
 Customer Sample ID: 16-08765-3-0N-D

Sample	ID	Lot	Carb #	Analyte	Unit	RTD %	Blank	Result	Duplicates	Average	RPD %	Spk Res %	Det Limit	Carb Er %	Qual Flags
Furans in Vapor Samples by SDG															
S16T000374		1191-09-7		2,3-Dihydrofuran	ugGS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a,U
S16T000374		1704-24-8		3,4-Dihydrofuran	ugGS	100	<0.45	0.47	n/a	n/a	n/a	n/a	0.45		n/a,U
S16T000374		829-06-5		2,3-Dimethylfuran	ugGS	86	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a,U
S16T000374		3177-71-7		2-Propylfuran	ugGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a,U
S16T000374		594-23-5		2-Methylfuran	ugGS	94	<0.15	0.17	n/a	n/a	n/a	n/a	0.15		n/a,U
S16T000374		3177-09-3		2-Pentylfuran	ugGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a,U
S16T000374		4229-91-8		2-Propylfuran	ugGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a,U
S16T000374		110-00-9		Furan	ugGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a,U
S16T000374		109-09-9		Tetrahydrofuran	ugGS	100	<0.31	0.7	n/a	n/a	n/a	n/a	0.31		n/a

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20161061
 SD40 Number:
 Customer Sample ID: 16-08765-3-IN-E
 Customer Sample ID: 16-08765-3-IN-E

Sample #	Alt	Case #	Analyte	Unit	RTD %	Blank	Result	Duplicates	Average	RSD %	Std Dev %	Std Limit	Car Bar %	Qual Flags
Furans in Vapor Samples by SD40														
5161006375		1181-09-7	2,3-Dihydrofuran	µG/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	n/a
5161006375		1796-29-8	2,3-Dihydrofuran	µG/S	112	<0.45	0.48	n/a	n/a	n/a	n/a	0.45	n/a	n/a
5161006375		625-06-5	2,3-Dimethylfuran	µG/S	80	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	n/a
5161006375		3777-71-7	2-Propylfuran	µG/S	92	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	n/a
5161006375		634-23-5	2-Methylfuran	µG/S	85	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	n/a
5161006375		3777-08-3	2-Pentylfuran	µG/S	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	n/a
5161006375		4229-81-8	2-Propylfuran	µG/S	92	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	n/a
5161006375		116-06-9	Furan	µG/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	n/a
5161006375		703-06-9	Tetrahydrofuran	µG/S	100	<0.31	31	n/a	n/a	n/a	n/a	0.31	n/a	n/a

NA = Not Analyzed, MD = Not Detected

J = Estimated

U = Units Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-0N-F
 Customer Sample ID: 16-08763-3-0N-F

Sample#	R	AI	CA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Qual Flag
Furans in Vapor Samples by SDG														
0167036376			1191-09-7	2,3-Dihydrofuran	ug/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a/J
0167036376			1706-29-8	2,3-Dihydrofuran	ug/S	100	<0.45	0.69	n/a	n/a	n/a	n/a	0.45	n/a/J
0167036376			623-86-5	2,3-Dimethylfuran	ug/S	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a/J
0167036376			3771-71-7	2-Heptylfuran	ug/S	92	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a/J
0167036376			534-23-3	2-Methylfuran	ug/S	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a/J
0167036376			3771-69-3	2-Propylfuran	ug/S	91	<0.29	0.66	n/a	n/a	n/a	n/a	0.29	n/a/J
0167036376			4229-91-8	2-Propylfuran	ug/S	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a/J
0167036376			110-00-9	Furan	ug/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a/J
0167036376			759-94-9	Tetrahydrofuran	ug/S	100	<0.31	26	n/a	n/a	n/a	n/a	0.31	n/a

NA = Not Analyzed, MD = Not Detected

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160501
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-G
 Customer Sample ID: 16-08765-3-IN-G

Sample	R	AI	CAI #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Cor %	Qual Flag
Furans in Vapor Samples by SIM															
21810200377			1191-05-7	2,3-Dihydrofuran	ng/S	1%	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
21810200377			1706-28-8	2,4-Dihydrofuran	ng/S	1%	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
21810200377			825-66-5	2,5-Dimethylfuran	ng/S	8%	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
21810200377			3777-71-7	2-Heptylfuran	ng/S	9%	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
21810200377			534-23-5	2-Methylfuran	ng/S	8%	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
21810200377			3777-68-3	2-Propylfuran	ng/S	9%	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
21810200377			4229-81-8	2-Propylfuran	ng/S	9%	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27		n/a U
21810200377			150-06-9	Furan	ng/S	10%	<0.95	<0.95	n/a	n/a	n/a	n/a	0.95		n/a U
21810200377			109-98-9	Tetrahydrofuran	ng/S	10%	<0.31	2.8	n/a	n/a	n/a	n/a	0.31		n/a

MA = Not Analyzed, MD = Not Detected

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161061
 SDC Number:
 Customer Sample ID: 16-08765-3-0N-H
 Customer Sample ID: 16-08765-3-0N-H

Sample	ID	AP	Carb #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SDC															
S-1610350378			1191-09-7	2,3-Dihydrofuran	ng/S	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S-1610350378			1708-29-8	2,4-Dihydrofuran	ng/S	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S-1610350378			825-04-5	2,3-Dimethylfuran	ng/S	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S-1610350378			3777-71-7	2-Heptylfuran	ng/S	90	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S-1610350378			534-23-5	2-Methylfuran	ng/S	94	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S-1610350378			3777-69-3	2-Propylfuran	ng/S	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S-1610350378			4229-91-8	2-Propylfuran	ng/S	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S-1610350378			110-00-9	Furan	ng/S	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S-1610350378			159-094-8	Tetrahydrofuran	ng/S	100	<0.31	34	n/a	n/a	n/a	n/a	0.31	n/a	U

MA = Not Analyzed, ND = Not Detected

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation
 Data Summary Report

John D. Jones
11/28/16

Sample Group: 20161063
 SDG Number:

Customer Sample ID: 16-08766-3-BASE-EFF
 Customer Sample ID: 16-08766-3-BASE-EFF

Sample #	R	Alt	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Det Err %	Qual Flag
Furans in Vapor Samples by DMA															
S16T005379			1194-99-7	2,3-Dihydrofuran	ug/S	6%	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T005379			1196-39-8	2,4-Dihydrofuran	ug/S	6%	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T005379			303-88-9	2,5-Dimethylfuran	ug/S	6%	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T005379			3177-71-7	2-Hexylfuran	ug/S	100%	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T005379			534-32-5	2-Methylfuran	ug/S	6%	<0.11	<0.11	n/a	n/a	n/a	n/a	0.11		n/a/U
S16T005379			3177-69-3	2-Pentylfuran	ug/S	100%	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T005379			4329-91-8	2-Propylfuran	ug/S	100%	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U
S16T005379			118-02-9	Furan	ug/S	6%	<0.66	<0.66	n/a	n/a	n/a	n/a	0.66		n/a/U
S16T005379			158-89-9	Tetrahydrofuran	ug/S	6%	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160363
 SDG Number:
 Customer Sample ID: 16-08766-3-BASE-1H
 Customer Sample ID: 16-08766-3-BASE-1H

Sample #	Alt #	Alt #	Sample	Unit	std. %	Blank	Result	Duplicate	Average	RFP %	Spk Rec %	Std Limit	Std Err %	Qual Flags
Furnas in Vapor Samples by SIR														
0187020300		1191-99-7	2,3-Dichlorobutane	9003	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a,U
0187020300		1196-29-8	2,3-Dibromobutane	9003	65	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a,U
0187020300		625-88-3	2,3-Dimethylbutane	9003	85	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a,U
0187020300		3777-71-7	2-Propylbutane	9003	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a,U
0187020300		524-23-5	2-Methylbutane	9003	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a,U
0187020300		3777-89-3	2-Pentylbutane	9003	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a,U
0187020300		4229-91-8	2-Propylbutane	9003	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a,U
0187020300		119-05-9	Furan	9003	95	<0.98	<0.98	n/a	n/a	n/a	n/a	0.98		n/a,U
0187020300		109-99-9	Tetrahydrofuran	9003	85	<0.31	0.79	n/a	n/a	n/a	n/a	0.31		n/a,J

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160362
 SDG Number:
 Customer Sample ID: 16-08766-3-BLANK-EFF
 Customer Sample ID: 16-08766-3-BLANK-EFF

Sample#	R	Alt	Cart #	Analyte	Unit	STD %	Blank	Revol	Repeats	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T000281			1191-09-7	2,3-Dihydrofuran	90S	66	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T000281			1706-29-8	2,3-Dihydrofuran	90S	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T000281			625-66-5	2,4-Dimethylfuran	90S	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T000281			2777-71-7	2-Hydroxyfuran	90S	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T000281			524-22-5	2-Methylfuran	90S	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T000281			2777-68-3	2-Furylfuran	90S	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T000281			4229-81-8	2-Propylfuran	90S	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T000281			110-00-9	Furan	90S	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T000281			109-89-9	Tetrahydrofuran	90S	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160362
 SDG Number:
 Customer Sample ID: 16-08766-3-BLANK-IH
 Customer Sample ID: 16-08766-3-BLANK-IH

Sample #	R	Alt	Lab #	Analyte	Unit	STD %	Blank	Recovery	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SIM															
S161005362			1191-99-7	2,3-Dihydrofuran	ug/g	66	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S161005362			1196-26-8	2,4-Dihydrofuran	ug/g	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S161005362			626-66-3	2,4-Dimethylfuran	ug/g	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S161005362			2777-71-7	2-Hydrofuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S161005362			524-22-5	2-Methylfuran	ug/g	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S161005362			2777-66-3	2-Furylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S161005362			4229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S161005362			116-06-9	Furan	ug/g	95	<0.66	<0.66	n/a	n/a	n/a	n/a	0.66		n/a/U
S161005362			169-09-9	Tetrahydrofuran	ug/g	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160362

SDG Number:

Customer Sample ID: 16-08766-3-EFF-A

Customer Sample ID: 16-08766-3-EFF-A

Sample#	R	Alt	Case #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RFPD %	Spk Res %	Std Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SIM															
S161000083			1191-09-7	2,3-Dihydrofuran	ug/g	66	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S161000083			1706-29-8	2,3-Dihydrofuran	ug/g	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S161000083			625-86-5	3,4-Dimethylfuran	ug/g	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S161000083			2777-71-7	2-Hydroxyfuran	ug/g	100	<0.38	0.63	n/a	n/a	n/a	n/a	0.38		n/a/U
S161000083			534-22-3	2-Methylfuran	ug/g	96	<0.15	0.18	n/a	n/a	n/a	n/a	0.15		n/a/U
S161000083			2777-48-3	3-Pentylfuran	ug/g	100	<0.29	0.68	n/a	n/a	n/a	n/a	0.29		n/a/U
S161000083			4229-81-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S161000083			119-00-9	Furan	ug/g	96	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S161000083			109-00-9	Tetrahydrofuran	ug/g	85	<0.31	0.63	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 201603062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-B

Customer Sample ID: 16-08766-3-EFF-B

Sample #	Alt	Cont #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Bias %	Det Limit	Corr En %	Qual Flags
Furans in Vapor Samples by SIM														
S16T003284		1785-09-7	2,3-Dihydrofuran	ug/S	66	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T003284		1706-29-8	2,3-Dihydrofuran	ug/S	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T003284		825-86-5	3,4-Dimethylfuran	ug/S	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T003284		2777-71-7	2-Hydroxyfuran	ug/S	100	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36		n/a/U
S16T003284		534-22-3	2-Methylfuran	ug/S	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T003284		2777-68-3	3-Pentylfuran	ug/S	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T003284		4239-81-6	2-Propylfuran	ug/S	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T003284		116-00-0	Furan	ug/S	95	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T003284		100-00-0	Tetrahydrofuran	ug/S	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163063
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-C
 Customer Sample ID: 16-08766-3-EFF-C

Sample #	AD	Cuts #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Det Est %	Qual Flag
Furans in Vapor Samples by SDG														
S-161035385		1191-89-7	2,3-Dihydrofuran	ug/g	85	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S-161035385		1706-29-8	2,5-Dihydrofuran	ug/g	84	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S-161035385		625-84-5	2,5-Dimethylfuran	ug/g	84	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S-161035385		3777-71-7	2-Hydrofuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S-161035385		534-23-5	2-Methylfuran	ug/g	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S-161035385		3777-69-3	2-Pentylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S-161035385		4228-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S-161035385		110-00-9	Furan	ug/g	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S-161035385		509-69-9	Tetrahydrofuran	ug/g	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

N/A = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-D

Customer Sample ID: 16-08766-3-EFF-D

Sample #	Alt #	Cart #	Analyte	Unit	STD %	Blank	Relevel	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cor Em %	Qual Flag
Furans in Vapor Samples by SDG														
S161005366		1181-99-7	2,3-Dihydrofuran	ug/S	85	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S161005366		1706-29-4	2,5-Dihydrofuran	ug/S	86	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S161005366		805-86-5	2,5-Dimethylfuran	ug/S	84	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S161005366		3777-71-7	2-Propylfuran	ug/S	100	<0.36	<0.36	n/a	n/a	n/a	n/a	0.36		n/a/U
S161005366		534-22-5	2-Methylfuran	ug/S	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S161005366		3777-69-3	2-Pentylfuran	ug/S	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S161005366		4028-91-8	2-Propylfuran	ug/S	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S161005366		110-00-8	Furan	ug/S	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S161005366		109-99-9	Tetrahydrofuran	ug/S	82	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161063

SDG Number:

Customer Sample ID: 16-08766-3-EFF-E

Customer Sample ID: 16-08766-3-EFF-E

Sample #	Lab #	Cell #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Upd Res %	Det Limit	Col Eff %	Qual Flag
Furans in Vapor Samples by SDG														
S-161035387		1191-99-7	2,3-Dihydrofuran	ug/g	85	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	n/a
S-161035387		1196-29-8	2,5-Dihydrofuran	ug/g	85	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	n/a
S-161035387		825-88-5	2,5-Dimethylfuran	ug/g	85	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	n/a
S-161035387		3177-71-7	2-Propylfuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	n/a
S-161035387		534-23-5	2-Methylfuran	ug/g	85	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	n/a
S-161035387		3177-69-3	2-Pentylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	n/a
S-161035387		4229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	n/a
S-161035387		119-62-9	Furan	ug/g	85	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	n/a
S-161035387		159-99-9	2-methylthiofuran	ug/g	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	n/a

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-G

Customer Sample ID: 16-08766-3-EFF-G

Sample #	R	Alt	Lot #	Analyte	Unit	STD %	Blank	Recovery	Duplicate	Average	RSD %	Spk Bias %	Std Limit	Corr Er %	Qual Flags
Furans in Vapor Samples by SIM															
1611030389			1191-99-7	2,3-Dihydrofuran	ug/g	66	-0.32	-0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
1611030389			1194-26-8	2,3-Dihydrofuran	ug/g	66	-0.45	-0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
1611030389			625-66-3	2,4-Dimethylfuran	ug/g	88	-0.26	-0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
1611030389			2777-71-7	2-Hydroxyfuran	ug/g	100	-0.38	-0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
1611030389			524-22-5	2-Methylfuran	ug/g	95	-0.15	-0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
1611030389			2777-66-3	2-Furylfuran	ug/g	100	-0.29	-0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
1611030389			4229-91-8	2-Propylfuran	ug/g	100	-0.21	-0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
1611030389			115-00-9	Furan	ug/g	95	-0.88	-0.88	n/a	n/a	n/a	n/a	0.88		n/a/U
1611030389			159-69-9	Tetrahydrofuran	ug/g	85	-0.31	-0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160663
 SDG Number:
 Customer Sample ID: 16-08766-3-EFF-4I
 Customer Sample ID: 16-08766-3-EFF-4I

Sample#	R	AI	CAS #	Analyte	Unit	std. %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Std Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SIM															
5187020280			1191-99-7	2,3-Dihydrofuran	ug/g	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
5187020280			1706-29-8	2,5-Dihydrofuran	ug/g	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
5187020280			825-88-5	2,5-Dimethylfuran	ug/g	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
5187020280			3777-71-7	2-Hydrofuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
5187020280			534-23-5	2-Methylfuran	ug/g	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
5187020280			3777-89-3	2-Furylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
5187020280			4229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
5187020280			310-82-9	Furan	ug/g	95	<0.68	<0.68	n/a	n/a	n/a	n/a	0.68		n/a U
5187020280			559-89-9	Tetrahydrofuran	ug/g	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

Y - Comment

U - Less Than Detection Limit

J - Estimated

MA = Not Analyzed, MD = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160662
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-A
 Customer Sample ID: 16-08766-3-IN-A

Sample#	R	AI	CAI #	Sample	Unit	std. %	Blank	Result	Duplicate	Average	RFP %	Exp Rec %	Det Limit	Cor Err %	Qual Flags
Furans in Vapor Samples by SDG															
2187020281			1191-89-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
2187020281			1756-29-8	2,5-Dihydrofuran	NGS	65	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
2187020281			625-88-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
2187020281			3777-71-7	2-Hydrofuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
2187020281			834-23-5	2-Methylfuran	NGS	65	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
2187020281			3777-89-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
2187020281			4226-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
2187020281			110-82-9	Furan	NGS	92	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
2187020281			759-89-6	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-B

Customer Sample ID: 16-08766-3-IN-B

Sample #	Lab	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Col Eff %	Qual Flags
Furans in Vapor Samples by SDG														
S161035382		191-99-7	2,3-Dihydrofuran	ug/g	85	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S161035382		198-29-8	2,4-Dihydrofuran	ug/g	86	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S161035382		825-86-3	2,4-Dimethylfuran	ug/g	86	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S161035382		2777-71-7	2-Propylfuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S161035382		834-22-5	2-Methylfuran	ug/g	85	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S161035382		2777-69-3	2-Propylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S161035382		6229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S161035382		116-90-9	Furan	ug/g	85	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S161035382		106-99-9	Tetrahydrofuran	ug/g	85	<0.31	29	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 28163662
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-C
 Customer Sample ID: 16-08766-3-IN-C

Sample #	R	Alt	Cal #	Analyte	Unit	STD %	Blank	Recovery	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flag
Furans in Vapor Samples by SIM															
S16T005293			1191-99-7	2,3-Dihydrofuran	ug/g	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T005293			1756-29-8	2,5-Dihydrofuran	ug/g	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T005293			626-88-3	2,3-Dimethylfuran	ug/g	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T005293			2777-71-7	2-Hydrofuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T005293			824-22-5	2-Methylfuran	ug/g	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T005293			3777-88-3	2-Furylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T005293			4229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T005293			118-00-8	Furan	ug/g	95	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T005293			169-89-9	Tetrahydrofuran	ug/g	85	<0.31	26	n/a	n/a	n/a	n/a	0.31		n/a

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 28163662
 SDG Number:
 Customer Sample ID: 16-08766-3-04-D
 Customer Sample ID: 16-08766-3-04-D

Sample#	R	Alt	Cal #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Err %	Qual Flag
Furans in Vapor Samples by SIM															
S187000204			1191-09-7	2,3-Dimethylfuran	ug/g	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S187000204			1756-29-8	2,3-Dimethylfuran	ug/g	66	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S187000204			625-66-3	2,3-Dimethylfuran	ug/g	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S187000204			2777-71-7	2-Hydroxyfuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S187000204			524-22-5	2-Methylfuran	ug/g	96	<0.55	<0.55	n/a	n/a	n/a	n/a	0.55		n/a/U
S187000204			2777-69-3	2-Furylfuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S187000204			4229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S187000204			115-00-9	Furan	ug/g	92	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S187000204			159-66-9	Tetrahydrofuran	ug/g	82	<0.31	33	n/a	n/a	n/a	n/a	0.31		n/a

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20161063

SDG Number:

Customer Sample ID: 16-08766-3-IN-E

Customer Sample ID: 16-08766-3-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Col Em %	Qual Flag
Furans in Vapor Samples by SDG															
S161005295			1191-99-7	2,3-Dihydrofuran	ug/S	6%	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S161005295			1308-29-8	2,4-Dihydrofuran	ug/S	6%	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S161005295			825-88-5	2,5-Dimethylfuran	ug/S	6%	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S161005295			2177-71-7	2-Hydroxyfuran	ug/S	10%	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S161005295			504-23-5	2-Methylfuran	ug/S	6%	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S161005295			2177-69-3	2-Pentylfuran	ug/S	10%	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S161005295			4229-91-8	2-Propylfuran	ug/S	10%	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S161005295			118-02-9	Furan	ug/S	6%	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S161005295			159-99-9	Tetrahydrofuran	ug/S	6%	<0.31	34	n/a	n/a	n/a	n/a	0.31		n/a

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
 Data Summary Report

Sample Group: 20183062
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-F
 Customer Sample ID: 16-08766-3-IN-F

Sample #	Alt #	Cell #	Analyte	Unit	RTD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Car Res %	Qual Flag
Furans in Vapor Samples by SDG														
S161933396		1191-09-7	2-3-Dihydrofuran	µG/G	60	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	n/a
S161933396		1198-09-8	2-5-Dihydrofuran	µG/G	60	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	n/a
S161933396		829-86-5	2,3-Dimethylfuran	µG/G	60	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	n/a
S161933396		3777-71-7	2-Propylfuran	µG/G	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	n/a
S161933396		834-22-5	2-Methylfuran	µG/G	60	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	n/a
S161933396		3777-69-3	2-Propylfuran	µG/G	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	n/a
S161933396		4229-81-8	2-Propylfuran	µG/G	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	n/a
S161933396		110-00-9	Furan	µG/G	60	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	n/a
S161933396		506-89-9	Tetrahydrofuran	µG/G	60	<0.31	28	n/a	n/a	n/a	n/a	0.31	n/a	n/a

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20160362
 SDG Number:
 Customer Sample ID: 14-08766-3-IN-G
 Customer Sample ID: 14-08766-3-IN-G

Sample #	R	AB	CAS #	Analyte	Unit	SPD %	Blank	Result	Duplicate	Average	RSD %	Spk Res %	Det Limit	Con Bar %	Qual Flag
Furans in Vapor Samples by SRI															
S141030387			1491-86-7	2,3-Dioxoluran	µG/G	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S141030387			1768-29-8	2,5-Dioxoluran	µG/G	65	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S141030387			823-88-3	2,3-Dimethylfuran	µG/G	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S141030387			3777-71-7	2-Hexylfuran	µG/G	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S141030387			534-23-5	2-Methylfuran	µG/G	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S141030387			3777-69-3	2-Pentylfuran	µG/G	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S141030387			4229-81-8	2-Propylfuran	µG/G	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S141030387			145-00-9	Furan	µG/G	95	<0.25	<0.25	n/a	n/a	n/a	n/a	0.25	n/a	U
S141030387			508-95-9	Tetrahydrofuran	µG/G	85	<0.31	34	n/a	n/a	n/a	n/a	0.31	n/a	U

MA = Not Analyzed, MD = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
 Data Summary Report

Sample Group: 20163062
 SDG Number:
 Customer Sample ID: 16-08766-3-IN-H
 Customer Sample ID: 16-08766-3-IN-H

Sample #	Lab	Lab #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Res %	Det Limit	Car Ben %	Qual Flag
Furans in Vapor Samples by SIM														
S16T020306		1191-09-7	2,3-Dihydrofuran	ug/g	60	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T020306		1198-09-8	2,5-Dihydrofuran	ug/g	60	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T020306		625-09-3	2,4-Dimethylfuran	ug/g	60	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T020306		2777-71-7	2-Hydrofuran	ug/g	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T020306		634-22-5	2-Methylfuran	ug/g	60	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T020306		2777-69-3	2-Furofuran	ug/g	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T020306		6229-91-8	2-Propylfuran	ug/g	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T020306		116-00-9	Furan	ug/g	60	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T020306		109-90-9	Tetrahydrofuran	ug/g	60	<0.31	31	n/a	n/a	n/a	n/a	0.31	n/a	U

MA = Not Analyzed, MD = Not Detected

Y = Comment

U = Less Than Detection Limit

J = Estimated



ANALYTICAL REPORT

Report Date: October 19, 2016

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20163059

Workorder: **34-1627934**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035274	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 162793-4001				Received: 10/05/2016
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg (NBS) Chloride		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035275	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 162793-4002				Received: 10/05/2016
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg (NBS) Chloride		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035276	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 162793-4003				Received: 10/05/2016
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg (NBS) Chloride		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

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Wed, 10/19/16 10:40 AM



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035277		Collected: 10/01/2016	
Lab ID: 1627934004		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	<0.10	NA	NA 0.10

Sample ID: S16T035278		Collected: 10/01/2016	
Lab ID: 1627934004		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	<0.10	NA	NA 0.10

Sample ID: S16T035279		Collected: 10/01/2016	
Lab ID: 1627934006		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	<0.10	NA	NA 0.10

Sample ID: S16T035280		Collected: 10/01/2016	
Lab ID: 1627934007		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	<0.10	NA	NA 0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035281		Collected: 10/01/2016		
Lab ID: 1627934008		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035282		Collected: 10/01/2016		
Lab ID: 1627934009		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035283		Collected: 10/01/2016		
Lab ID: 1627934010		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035284		Collected: 10/01/2016		
Lab ID: 1627934011		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035285		Collected: 10/01/2016		
Lab ID: 1627934012		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035286		Collected: 10/01/2016		
Lab ID: 1627934013		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.73	NA	NA	0.10

Sample ID: S16T035287		Collected: 10/01/2016		
Lab ID: 1627934014		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	2.1	NA	NA	0.10

Sample ID: S16T035288		Collected: 10/01/2016		
Lab ID: 1627934015		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	5.4	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re19
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035289		Collected: 10/01/2016	
Lab ID: 1627934016		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	3.1	NA	NA 0.10
Methylamine	8.4	NA	NA 0.10

Sample ID: S16T035290		Collected: 10/01/2016	
Lab ID: 1627934017		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	5.5	NA	NA 0.10

Sample ID: S16T035291		Collected: 10/01/2016	
Lab ID: 1627934018		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	5.2	NA	NA 0.10

Sample ID: S16T035292		Collected: 10/01/2016	
Lab ID: 1627934019		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube	
		50/100mg [(NBD) Chloride]	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Dimethylamine	<0.10	NA	NA 0.10
Ethylamine	<0.10	NA	NA 0.10
Methylamine	<0.10	NA	NA 0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035293		Collected: 10/01/2016		
Lab ID: 1627934020		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	3.0	NA	NA	0.10
Methylamine	2.3	NA	NA	0.10

Sample ID: S16T035294		Collected: 10/02/2016		
Lab ID: 1627934021		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/17/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035295		Collected: 10/02/2016		
Lab ID: 1627934022		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035296		Collected: 10/02/2016		
Lab ID: 1627934023		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reis
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035297		Collected: 10/02/2016		
Lab ID: 1627934024		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035298		Collected: 10/02/2016		
Lab ID: 1627934025		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035299		Collected: 10/02/2016		
Lab ID: 1627934026		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035300		Collected: 10/02/2016		
Lab ID: 1627934027		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035301		Collected: 10/02/2016		
Lab ID: 1627934028		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035302		Collected: 10/02/2016		
Lab ID: 1627934029		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035303		Collected: 10/02/2016		
Lab ID: 1627934030		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035304		Collected: 10/02/2016		
Lab ID: 1627934031		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035305		Collected: 10/02/2016		
Lab ID: 1627934032		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035306		Collected: 10/02/2016		
Lab ID: 1627934033		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	2.2	NA	NA	0.10

Sample ID: S16T035307		Collected: 10/02/2016		
Lab ID: 1627934034		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	3.4	NA	NA	0.10

Sample ID: S16T035308		Collected: 10/02/2016		
Lab ID: 1627934035		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	2.6	NA	NA	0.10
Methylamine	5.3	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035309		Collected: 10/02/2016		
Lab ID: 1627934039		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	2.9	NA	NA	0.10
Methylamine	7.1	NA	NA	0.10

Sample ID: S16T035310		Collected: 10/02/2016		
Lab ID: 1627934037		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	8.18	NA	NA	0.10
Ethylamine	2.0	NA	NA	0.10
Methylamine	5.9	NA	NA	0.10

Sample ID: S16T035311		Collected: 10/02/2016		
Lab ID: 1627934038		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	4.3	NA	NA	0.10

Sample ID: S16T035312		Collected: 10/02/2016		
Lab ID: 1627934039		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	4.3	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Relo
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035313	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 162793-4040				Received: 10/05/2016
Method: Amines-VOA Aliphatic VAA-1	Media: SKC 228-86, XAD-7 Tube 50/100mg (HSC) Chloride			Analyzed: 10/18/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (ng/m ³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	3.6	NA	NA	0.10

Report Authorization: /S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Amines-VOA Aliphatic VAA-1	/S/ Christopher Winter 10/18/2016 16:48	/S/ Thomas Bosch 10/19/2016 10:33

Laboratory Contact Information

ALS Environmental
950 W Levoe Drive
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ANALYTICAL REPORT

Workorder: **34-1627934**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD/ELAP)	ADE-1430	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/testing/
	Nevada	UT00009	http://ndep.nv.gov/inside/lab/service.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 179	http://www.iowadnr.gov/inside/Civil/Regulatory/Water.aspx
	Texas (TNE)	T104704456-11-1	http://www.tceq.texas.gov/fieldqa/lab_accred_certif.html
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Kansas	E-104 95	http://www.kdheks.gov/pol/index.html	
Industrial Hygiene	AHA LAF LLC (ISO 17025 & IS-IR/ELLAP)	101574	http://www.ahaaccreditedata.org
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Lead Testing: CPSC	ANAB (ISO 17025, CPSC)	ADE-1430	http://www.anab.org/accredited-organizations/
	Soil, Dust, Paint, Air AHA LAF LLC (ISO 17025 & IS-IR/ELLAP)	101574	http://www.ahaaccreditedata.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1430	http://www.aclascorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
 ND = Not Detected, Testing result not detected above the LOD or LOQ.
 NA = Not Applicable.
 "" No result could be reported, see sample comments for details.
 < This testing result is less than the numerical value.
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627934

Limits: Historical Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: H-Alphaic Amines
Batch: LC12907 (494: 178594)
Analyzed By: Christopher Winer

Blank

LMB: 522670
Analyzed: 10/15/2016 16:39

Units: ug/sample

Analyte	Result	MDL	RL
Dimethylamine	ND	NA	0.100
Ethylamine	ND	NA	0.100
Methylamine	ND	NA	0.100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 522671
Analyzed: 10/15/2016 16:55
Dilution: 1
Units: ug/sample

LCSD: 522672
Analyzed: 10/15/2016 17:10
Dilution: 1
Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Dimethylamine	4.02	4.00	100	60.4 134.6	4.12	103	2.68	0.0 20.0
Ethylamine	4.48	4.00	112	40.0 160.0	4.76	119	6.09	0.0 20.0
Methylamine	4.42	4.00	111	40.0 160.0	4.40	110	0.987	0.0 20.0

QC Report Authorization (e/S is an electronic signature that complies with 21 CFR Part 11)

Analyt	Peer Review
e/S/Christopher Winer 10/16/2016 16:28	e/S/Thomas Bosch 10/19/2016 10:29

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ★ - Result is above the calibration range

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627934

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: 34 Aliphatic Amines
Batch: LC/12908 (484: 178588)
Analyzed By: Christopher Winer

Blank

LMB: 522673
Analyzed: 10/15/2016 23:04

Units: ug/sample

Analyte	Result	MDL	RL
Dimethylamine	ND	NA	0.100
Ethylamine	ND	NA	0.100
Methylamine	ND	NA	0.100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCB: 522674
Analyzed: 10/15/2016 23:19
Dilution: 1
Units: ug/sample

LCRD: 522675
Analyzed: 10/15/2016 23:34
Dilution: 1
Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Dimethylamine	4.05	4.00	101	60.4 134.6	4.06	99.9	0.822	0.0 20.0
Ethylamine	4.50	4.00	112	40.0 160.0	4.53	113	0.709	0.0 20.0
Methylamine	4.35	4.00	108	40.0 160.0	4.37	109	0.896	0.0 20.0

QC Report Authorization (eS is an electronic signature that complies with 21 CFR Part 11)

Analyt	Peer Review
eS/Christopher Winer 10/16/2016 16:48	eS/Thomas Bosch 10/19/2016 10:33

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ★ - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

Assembler		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		COC No. 20143053		
BVA		Telephone No. 313-6861		Page 4 of 4		
Collector Name		Contract/Inventory No. 313-6861		Fax 313-1878		
SAP No.		Sample Origin		Project/Change Code		
Project Title		Logbook/Work Package No.		Date		
Shipped To (Lab)		Method of Shipment		Date Turnaround		
Principal		Date Turnaround		Date		
Sample No.	Lab ID	Date	Time	Field/Type Container	Sample Analysis	Preservative
31	0140000104	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
32	0140000105	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
33	0140000106	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
34	0140000107	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
35	0140000108	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
36	0140000109	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
37	0140000110	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
38	0140000111	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
39	0140000112	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A
40	0140000113	VA	10/02/74	0420-7-080	042000 14-08700-4-077-0	07A

SPECIAL INSTRUCTIONS:
 Read Remarks to Client. Forward by 4 Grey
 Priority Mail/Registered Mail and
 Insured. See contract for details.
 CONTRACT 00000
 RELEASE 1

Requested by	Field	Sign	Date/Time	Collected by	Received by	Date/Time	Field/Type	Container	Preservative
THOMAS ROBERTSON	0140000113	THOMAS ROBERTSON	10/02/74	THOMAS ROBERTSON	THOMAS ROBERTSON	10/02/74	0420-7-080	042000	07A
Requested by	Field	Sign	Date/Time	Collected by	Received by	Date/Time	Field/Type	Container	Preservative
Requested by	Field	Sign	Date/Time	Collected by	Received by	Date/Time	Field/Type	Container	Preservative

ALL SAMPLES CONTAINING HAZARDOUS MATERIALS shall be picked up by requestor and returned to parent container or site of origin.



ANALYTICAL REPORT

Report Date: October 11, 2016

Robert (Buddy) Sosa
Washington River Protection So
PO Box 850, MSIN T8-02
Richland, WA 99052

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov
20163057

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353193	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926001				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353194	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926002				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353195	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926003				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

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environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Repl
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353196	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926004				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353197	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926005				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353198	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926006				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353199	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926007				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353200	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627926008				Received: 10/05/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Repl
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353291		Collected: 10/01/2016	
Lab ID: 1627926009	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353292		Collected: 10/01/2016	
Lab ID: 1627926010	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353293		Collected: 10/01/2016	
Lab ID: 1627926011	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353294		Collected: 10/01/2016	
Lab ID: 1627926012	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353295		Collected: 10/01/2016	
Lab ID: 1627926013	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reel
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353206		Collected: 10/01/2016	
Lab ID: 1627926014	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353207		Collected: 10/01/2016	
Lab ID: 1627926015	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353208		Collected: 10/01/2016	
Lab ID: 1627926016	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353209		Collected: 10/01/2016	
Lab ID: 1627926017	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353210		Collected: 10/01/2016	
Lab ID: 1627926018	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reel
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353211		Collected: 10/01/2016	
Lab ID: 1627926019		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353212		Collected: 10/01/2016	
Lab ID: 1627926020		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353213		Collected: 10/02/2016	
Lab ID: 1627926021		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353214		Collected: 10/02/2016	
Lab ID: 1627926022		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353215		Collected: 10/02/2016	
Lab ID: 1627926023		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reel
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353216	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926024				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353217	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926025				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353218	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926026				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353219	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926027				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353220	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926028				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reel
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353221		Collected: 10/02/2016	
Lab ID: 1627926029	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353222		Collected: 10/02/2016	
Lab ID: 1627926030	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353223		Collected: 10/02/2016	
Lab ID: 1627926031	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353224		Collected: 10/02/2016	
Lab ID: 1627926032	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353225		Collected: 10/02/2016	
Lab ID: 1627926033	Sampling Location: CARTRIDGE EVALUATION	Received: 10/06/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Repl
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353226	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926034				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353227	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926035				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353228	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926036				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353229	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926037				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353230	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627926038				Received: 10/06/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reil
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353231		Collected: 10/02/2016		
Lab ID: 1627926039		Received: 10/06/2016		
Method: NIOSH 1606		Medic: SKC 228-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353232		Collected: 10/02/2016		
Lab ID: 1627926040		Received: 10/06/2016		
Method: NIOSH 1606		Medic: SKC 228-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Comments

Quality Control: NIOSH 1606 - (HBN: 177913)
QC samples 521377, 521378, and 521379 are associated with samples 1627926001-020. QC samples 521380, 521381, and 521382 are associated with samples 1627926021-040.

Report Authorization: (eS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1606	eS/ Young Hee Yoon 10/11/2016 14:31	eS/ Thomas J. Masolen 10/11/2016 15:18

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1627926**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD/ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/testing/
	Nevada	UT00009	http://ndep.nv.gov/inside/lab/service.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 179	http://www.iowadnr.gov/inside/Civil/Regulatory/Water.aspx
	Texas (TNE)	T104704456-11-1	http://www.tceq.texas.gov/fieldqa/lab_accred_certif.html
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Kansas	E-104 95	http://www.kdhehs.gov/pol/index.html	
Industrial Hygiene	AHA LAF LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedlabs.org
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Lead Testing: CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
	Soil, Dust, Paint, Air AHA LAF LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclascorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
 ND = Not Detected, Testing result not detected above the LOD or LOQ.
 NA = Not Applicable.
 "" No result could be reported, see sample comments for details.
 < This testing result is less than the numerical value.
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: **1627926**

Limits: Historical Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: H GC-FID-QC
Batch: #FD7820 (HBN: 177913)
Analyzed By: Young Hee Yoon

Blank

MB: 521377 Analyzed: 10/07/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100
MB: 521380 Analyzed: 10/07/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521378 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample					LCS: 521379 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.250	0.250	104	98.8 115.3	0.256	103	1.17	0.0 20.0	
LCS: 521381 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample					LCS: 521382 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.305	0.312	97.8	98.8 115.3	0.308	98.7	0.976	0.0 20.0	

Comments

QC samples 521377, 521378, and 521379 are associated with samples 1627926001-020. QC samples 521380, 521381, and 521382 are associated with samples 1627926021-040.

QC Report Authorization (e/S) is an electronic signature that complies with 21 CFR Part 11)

Analyt	Peer Review
/s/ Young Hee Yoon 10/11/2016 14:31	/s/ Thomas J. Mancian 10/11/2016 15:18

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

**FINAL REPORT ON MERCURY VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 – 2, 2016**

Document No.: 20163050 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
November 2, 2016



Prepared for:

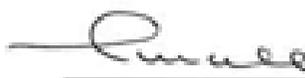


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 November 2, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON MERCURY VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 - 2, 2016**

This final report presents the results of forty mercury vapor tubes received at the 222-S Laboratory on October 3, 2016, in good condition and with adequate paperwork. The mercury vapor tubes were logged into sample delivery group 20163050.

DISCLAIMERS

- The information contained in this report is intended only for the use of the addressee and should be considered confidential.
- This report shall not be reproduced, except in full, without written approval of the laboratory.
- The results shown in this report pertain only to the actual samples tested.
- These results conform to the requirements specified in the referenced methods/procedures and specifications provided verbally or electronically by the customer. Any deviations or modifications are discussed in the following narrative.
- This report only addresses laboratory activities related to the listed surveys. Requirements or anomalies concerning field sampling are not addressed in this report.

PROCEDURES

Method	Preparation Procedure	Analysis Procedure
Mercury by OSHA ID-140	LA-325-109, Rev. 2-4	LA-325-109, Rev. 2-4

ANALYTICAL SUMMARY

The vapor tubes were tested for mercury, as specified on the chain of custody. Standard laboratory procedures for digestions and cold vapor atomic absorption for mercury were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory* (QAPP). Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control standards (LCS). For mercury, the results of 178 LCS determinations indicate a mean recovery of 98% with a standard deviation of 6%. Statistical process control limits for the LCS are 81 – 115%, with no significant bias. The overall estimate of uncertainty is 12%, with coverage factor (k) = 2.

Background levels of mercury or interfering compounds can be present in the sorbent tube media used for collecting vapor samples. OSHA ID-140 recommends that the laboratory determine the average background for each lot of media and subtract it from the sample results prior to reporting. However, per agreement with the client, this background is being determined by the client using blank media submitted as blind samples to the laboratory. Any blank subtraction from the sample results will be performed by the client. The laboratory is using the same media

for QC samples. These QC samples may not match the lot numbers of the samples being submitted and the background for this QC sample media has not been determined. Over the past several years the results from preparation blanks, field blanks, and the vast majority of samples have been below the laboratory's method detection limit, which is an order of magnitude below the reporting limit. In general, the laboratory believes there is no need for background subtraction using the current sample media (Hydrar, SKC 226-17-1A).

For the mercury analysis, the blank results for tube lot numbers 8679, 9473, and 7043 were below the detection limit; therefore, no blank correction was required. Fifteen of the forty mercury results for sample group 20163050 were above the reporting limit of 0.05 µg per sample. For these samples, the total result includes the contribution from the back glass wool portion even though the back glass wool portion result is lower than the reporting limit (see Attachment 1).

20163050 Rev. 0

Attachment 1

DATA SUMMARY REPORT

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DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-6-BA3E-1PF	Total	SI6T035111	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BA3E-1PF	Resin	SI6T035112	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BA3E-1PF	Glass Wool	SI6T035113	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BA3E-1N	Total	SI6T035114	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BA3E-1N	Resin	SI6T035115	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BA3E-1N	Glass Wool	SI6T035116	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Total	SI6T035117	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Resin	SI6T035118	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Glass Wool	SI6T035119	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Total	SI6T035120	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Resin	SI6T035121	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Glass Wool	SI6T035122	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-A	Total	SI6T035143	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-A	Resin	SI6T035144	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-A	Glass Wool	SI6T035145	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-B	Total	SI6T035146	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-B	Resin	SI6T035147	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-B	Glass Wool	SI6T035148	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-C	Total	SI6T035149	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-C	Resin	SI6T035150	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-C	Glass Wool	SI6T035151	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-D	Total	SI6T035152	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-D	Resin	SI6T035153	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-D	Glass Wool	SI6T035154	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-E	Total	SI6T035155	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-E	Resin	SI6T035156	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-E	Glass Wool	SI6T035157	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-F	Total	SI6T035158	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-F	Resin	SI6T035160	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-F	Glass Wool	SI6T035162	Mercury	ug/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-1PF-G	Total	SI6T035163	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-G	Resin	SI6T035164	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-1PF-G	Glass Wool	SI6T035165	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-1PF-H	Total	SI6T035166	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-1PF-H	Resin	SI6T035167	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-1PF-H	Glass Wool	SI6T035168	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-A	Total	SI6T035169	Mercury	ug/sample	n/a	<0.0500	0.0773	0.0500
16-08765-6-IN-A	Resin	SI6T035170	Mercury	ug/sample	91.9	<0.0500	0.0725	0.0500
16-08765-6-IN-A	Glass Wool	SI6T035171	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-B	Total	SI6T035172	Mercury	ug/sample	n/a	<0.0500	0.0710	0.0500
16-08765-6-IN-B	Resin	SI6T035173	Mercury	ug/sample	91.9	<0.0500	0.0660	0.0500
16-08765-6-IN-B	Glass Wool	SI6T035174	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-C	Total	SI6T035175	Mercury	ug/sample	n/a	<0.0500	0.0734	0.0500
16-08765-6-IN-C	Resin	SI6T035176	Mercury	ug/sample	91.9	<0.0500	0.0684	0.0500
16-08765-6-IN-C	Glass Wool	SI6T035177	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-D	Total	SI6T035178	Mercury	ug/sample	n/a	<0.0500	0.0802	0.0500
16-08765-6-IN-D	Resin	SI6T035179	Mercury	ug/sample	91.9	<0.0500	0.0732	0.0500
16-08765-6-IN-D	Glass Wool	SI6T035180	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-6-IN-E	Total	SI6T035183	Mercury	ug/sample	n/a	<0.0500	0.0722	0.0500
16-08765-6-IN-E	Resin	SI6T035183	Mercury	ug/sample	91.9	<0.0500	0.0672	0.0500
16-08765-6-IN-E	Glass Wool	SI6T035183	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-F	Total	SI6T035184	Mercury	ug/sample	n/a	<0.0500	0.0776	0.0500
16-08765-6-IN-F	Resin	SI6T035184	Mercury	ug/sample	91.9	<0.0500	0.0726	0.0500
16-08765-6-IN-F	Glass Wool	SI6T035184	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Total	SI6T035187	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Resin	SI6T035188	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Glass Wool	SI6T035189	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-H	Total	SI6T035190	Mercury	ug/sample	n/a	<0.0500	0.0803	0.0500
16-08765-6-IN-H	Resin	SI6T035191	Mercury	ug/sample	91.9	<0.0500	0.0813	0.0500
16-08765-6-IN-H	Glass Wool	SI6T035192	Mercury	ug/sample	91.9	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-EFF	Total	SI6T035273	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-EFF	Resin	SI6T035354	Mercury	ug/sample	93.8	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-EFF	Glass Wool	SI6T035355	Mercury	ug/sample	93.8	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-IN	Total	SI6T035356	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-IN	Resin	SI6T035357	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BA,SE-IN	Glass Wool	SI6T035358	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EFF	Total	SI6T035399	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EFF	Resin	SI6T035400	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EFF	Glass Wool	SI6T035401	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Total	SI6T035402	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Resin	SI6T035403	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Glass Wool	SI6T035404	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-A	Total	SI6T035405	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-A	Resin	SI6T035406	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-A	Glass Wool	SI6T035407	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-B	Total	SI6T035408	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-B	Resin	SI6T035409	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-B	Glass Wool	SI6T035410	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-C	Total	SI6T035411	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-C	Resin	SI6T035412	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-C	Glass Wool	SI6T035413	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-D	Total	SI6T035404	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-D	Resin	SI6T035405	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-D	Glass Wool	SI6T035406	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-E	Total	SI6T035517	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-E	Resin	SI6T035528	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-E	Glass Wool	SI6T035529	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-F	Total	SI6T035540	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-F	Resin	SI6T035541	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-F	Glass Wool	SI6T035542	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-G	Total	SI6T035553	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-G	Resin	SI6T035554	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-G	Glass Wool	SI6T035555	Mercury	ug/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-IEF-H	Total	SI6T035727	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-IEF-H	Resin	SI6T035728	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IEF-H	Glass Wool	SI6T035729	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08766-6-IN-A	Total	SI6T035730	Mercury	ug/sample	n/a	<0.0500	0.0805	0.0500
16-08766-6-IN-A	Resin	SI6T035731	Mercury	ug/sample	88.1	<0.0500	0.0755	0.0500
16-08766-6-IN-A	Glass Wool	SI6T035732	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-B	Total	SI6T035735	Mercury	ug/sample	n/a	<0.0500	0.0820	0.0500
16-08766-6-IN-B	Resin	SI6T035736	Mercury	ug/sample	88.1	<0.0500	0.0770	0.0500
16-08766-6-IN-B	Glass Wool	SI6T035737	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-C	Total	SI6T035738	Mercury	ug/sample	n/a	<0.0500	0.0776	0.0500
16-08766-6-IN-C	Resin	SI6T035739	Mercury	ug/sample	88.1	<0.0500	0.0726	0.0500
16-08766-6-IN-C	Glass Wool	SI6T035740	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-D	Total	SI6T035741	Mercury	ug/sample	n/a	<0.0500	0.0780	0.0500
16-08766-6-IN-D	Resin	SI6T035742	Mercury	ug/sample	88.1	<0.0500	0.0730	0.0500
16-08766-6-IN-D	Glass Wool	SI6T035743	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-E	Total	SI6T035744	Mercury	ug/sample	n/a	<0.0500	0.0793	0.0500
16-08766-6-IN-E	Resin	SI6T035745	Mercury	ug/sample	88.1	<0.0500	0.0743	0.0500
16-08766-6-IN-E	Glass Wool	SI6T035746	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-F	Total	SI6T035747	Mercury	ug/sample	n/a	<0.0500	0.0804	0.0500
16-08766-6-IN-F	Resin	SI6T035748	Mercury	ug/sample	88.1	<0.0500	0.0754	0.0500
16-08766-6-IN-F	Glass Wool	SI6T035749	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-G	Total	SI6T035750	Mercury	ug/sample	n/a	<0.0500	0.0848	0.0500
16-08766-6-IN-G	Resin	SI6T035751	Mercury	ug/sample	88.1	<0.0500	0.0798	0.0500
16-08766-6-IN-G	Glass Wool	SI6T035752	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-H	Total	SI6T035754	Mercury	ug/sample	n/a	<0.0500	0.0865	0.0500
16-08766-6-IN-H	Resin	SI6T035757	Mercury	ug/sample	88.1	<0.0500	0.0815	0.0500
16-08766-6-IN-H	Glass Wool	SI6T035758	Mercury	ug/sample	88.1	<0.0500	<0.0500	0.0500

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Attachment 2

ANALYSIS DATE REPORT

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ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163050

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035112	16-08765-6-BASE-EFF	Mercury	10/04/2016 14:00	10/04/2016 16:38
S16T035113	16-08765-6-BASE-EFF	Mercury	10/04/2016 14:00	10/04/2016 16:40
S16T035114	16-08765-6-BASE-IN	Mercury	10/04/2016 14:00	10/04/2016 16:41
S16T035116	16-08765-6-BASE-IN	Mercury	10/04/2016 14:00	10/04/2016 16:43
S16T035118	16-08765-6-BLANK1	Mercury	10/04/2016 14:00	10/04/2016 16:44
S16T035119	16-08765-6-BLANK1	Mercury	10/04/2016 14:00	10/04/2016 16:46
S16T035121	16-08765-6-BLANK2	Mercury	10/04/2016 14:00	10/04/2016 16:51
S16T035122	16-08765-6-BLANK2	Mercury	10/04/2016 14:00	10/04/2016 16:53
S16T035144	16-08765-6-EFF-A	Mercury	10/04/2016 14:00	10/04/2016 16:55
S16T035145	16-08765-6-EFF-A	Mercury	10/04/2016 14:00	10/04/2016 16:57
S16T035147	16-08765-6-EFF-B	Mercury	10/04/2016 14:00	10/04/2016 16:58
S16T035148	16-08765-6-EFF-B	Mercury	10/04/2016 14:00	10/04/2016 17:00
S16T035150	16-08765-6-EFF-C	Mercury	10/04/2016 14:00	10/04/2016 17:02
S16T035151	16-08765-6-EFF-C	Mercury	10/04/2016 14:00	10/04/2016 17:03
S16T035153	16-08765-6-EFF-D	Mercury	10/04/2016 14:00	10/04/2016 17:05
S16T035154	16-08765-6-EFF-D	Mercury	10/04/2016 14:00	10/04/2016 17:06
S16T035156	16-08765-6-EFF-E	Mercury	10/04/2016 14:00	10/04/2016 17:11
S16T035157	16-08765-6-EFF-E	Mercury	10/04/2016 14:00	10/04/2016 17:13
S16T035161	16-08765-6-EFF-F	Mercury	10/04/2016 14:00	10/04/2016 17:14
S16T035162	16-08765-6-EFF-F	Mercury	10/04/2016 14:00	10/04/2016 17:16
S16T035164	16-08765-6-EFF-G	Mercury	10/04/2016 14:00	10/04/2016 17:23
S16T035165	16-08765-6-EFF-G	Mercury	10/04/2016 14:00	10/04/2016 17:25
S16T035167	16-08765-6-EFF-H	Mercury	10/04/2016 14:00	10/04/2016 17:30
S16T035168	16-08765-6-EFF-H	Mercury	10/04/2016 14:00	10/04/2016 17:31
S16T035170	16-08765-6-IN-A	Mercury	10/04/2016 14:00	10/04/2016 17:33
S16T035171	16-08765-6-IN-A	Mercury	10/04/2016 14:00	10/04/2016 17:35
S16T035173	16-08765-6-IN-B	Mercury	10/04/2016 14:00	10/04/2016 17:36
S16T035174	16-08765-6-IN-B	Mercury	10/04/2016 14:00	10/04/2016 17:38
S16T035176	16-08765-6-IN-C	Mercury	10/04/2016 14:00	10/04/2016 17:40
S16T035177	16-08765-6-IN-C	Mercury	10/04/2016 14:00	10/04/2016 17:42
S16T035179	16-08765-6-IN-D	Mercury	10/04/2016 14:00	10/04/2016 17:43
S16T035180	16-08765-6-IN-D	Mercury	10/04/2016 14:00	10/04/2016 17:45
S16T035182	16-08765-6-IN-E	Mercury	10/04/2016 14:00	10/04/2016 17:50
S16T035183	16-08765-6-IN-E	Mercury	10/04/2016 14:00	10/04/2016 17:52
S16T035185	16-08765-6-IN-F	Mercury	10/04/2016 14:00	10/04/2016 17:53
S16T035186	16-08765-6-IN-F	Mercury	10/04/2016 14:00	10/04/2016 17:55
S16T035188	16-08765-6-IN-G	Mercury	10/04/2016 14:00	10/04/2016 17:57
S16T035189	16-08765-6-IN-G	Mercury	10/04/2016 14:00	10/04/2016 17:59
S16T035191	16-08765-6-IN-H	Mercury	10/04/2016 14:00	10/04/2016 18:00
S16T035192	16-08765-6-IN-H	Mercury	10/04/2016 14:00	10/04/2016 18:02
S16T035334	16-08766-6-BASE-EFF	Mercury	10/06/2016 16:00	10/06/2016 19:59
S16T035335	16-08766-6-BASE-EFF	Mercury	10/06/2016 16:00	10/06/2016 20:01
S16T035337	16-08766-6-BASE-IN	Mercury	10/06/2016 16:00	10/06/2016 20:08
S16T035338	16-08766-6-BASE-IN	Mercury	10/06/2016 16:00	10/06/2016 20:10
S16T035400	16-08766-6-BLANK-EFF	Mercury	10/06/2016 16:00	10/06/2016 20:15
S16T035401	16-08766-6-BLANK-EFF	Mercury	10/06/2016 16:00	10/06/2016 20:17

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163050

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035403	16-08766-6-BLANK-IN	Mercury	10/06/2016 16:00	10/06/2016 20:18
S16T035404	16-08766-6-BLANK-IN	Mercury	10/06/2016 16:00	10/06/2016 20:20
S16T035406	16-08766-6-EPP-A	Mercury	10/06/2016 16:00	10/06/2016 20:22
S16T035407	16-08766-6-EPP-A	Mercury	10/06/2016 16:00	10/06/2016 20:23
S16T035409	16-08766-6-EPP-B	Mercury	10/06/2016 16:00	10/06/2016 20:25
S16T035410	16-08766-6-EPP-B	Mercury	10/06/2016 16:00	10/06/2016 20:26
S16T035412	16-08766-6-EPP-C	Mercury	10/06/2016 16:00	10/06/2016 20:28
S16T035413	16-08766-6-EPP-C	Mercury	10/06/2016 16:00	10/06/2016 20:30
S16T035505	16-08766-6-EPP-D	Mercury	10/06/2016 16:00	10/06/2016 20:35
S16T035506	16-08766-6-EPP-D	Mercury	10/06/2016 16:00	10/06/2016 20:37
S16T035528	16-08766-6-EPP-E	Mercury	10/06/2016 16:00	10/06/2016 20:38
S16T035529	16-08766-6-EPP-E	Mercury	10/06/2016 16:00	10/06/2016 20:40
S16T035541	16-08766-6-EPP-F	Mercury	10/06/2016 16:00	10/06/2016 20:42
S16T035542	16-08766-6-EPP-F	Mercury	10/06/2016 16:00	10/06/2016 20:44
S16T035554	16-08766-6-EPP-G	Mercury	10/06/2016 16:00	10/06/2016 20:45
S16T035555	16-08766-6-EPP-G	Mercury	10/06/2016 16:00	10/06/2016 20:47
S16T035728	16-08766-6-EPP-H	Mercury	10/10/2016 08:00	10/10/2016 10:37
S16T035729	16-08766-6-EPP-H	Mercury	10/10/2016 08:00	10/10/2016 10:38
S16T035731	16-08766-6-IN-A	Mercury	10/10/2016 08:00	10/10/2016 10:40
S16T035732	16-08766-6-IN-A	Mercury	10/10/2016 08:00	10/10/2016 10:41
S16T035736	16-08766-6-IN-B	Mercury	10/10/2016 08:00	10/10/2016 10:43
S16T035737	16-08766-6-IN-B	Mercury	10/10/2016 08:00	10/10/2016 10:45
S16T035739	16-08766-6-IN-C	Mercury	10/10/2016 08:00	10/10/2016 10:50
S16T035740	16-08766-6-IN-C	Mercury	10/10/2016 08:00	10/10/2016 10:52
S16T035742	16-08766-6-IN-D	Mercury	10/10/2016 08:00	10/10/2016 10:53
S16T035743	16-08766-6-IN-D	Mercury	10/10/2016 08:00	10/10/2016 10:55
S16T035745	16-08766-6-IN-E	Mercury	10/10/2016 08:00	10/10/2016 10:57
S16T035746	16-08766-6-IN-E	Mercury	10/10/2016 08:00	10/10/2016 10:58
S16T035748	16-08766-6-IN-F	Mercury	10/10/2016 08:00	10/10/2016 11:00
S16T035749	16-08766-6-IN-F	Mercury	10/10/2016 08:00	10/10/2016 11:02
S16T035751	16-08766-6-IN-G	Mercury	10/10/2016 08:00	10/10/2016 11:03
S16T035752	16-08766-6-IN-G	Mercury	10/10/2016 08:00	10/10/2016 11:05
S16T035757	16-08766-6-IN-H	Mercury	10/10/2016 08:00	10/10/2016 11:10
S16T035758	16-08766-6-IN-H	Mercury	10/10/2016 08:00	10/10/2016 11:12

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Attachment 3

RECEIPT PAPERWORK

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222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST			ATS-LO-090-101 Rev. 00-1
Date Samples Received: <u>10-3-16</u> Total Number of Samples: <u>480</u> Group #: <u>20163050-HK</u>				
Sample Custodian: <u>Diane Turner</u> IH Technician: <u>Bob Brown</u> <u>10-3-16</u>				
Sample Custodian to Complete				
Action	Yes	No	N/A	Comments
RSR provided?			<input checked="" type="checkbox"/>	
Verify GAG is complete			<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File
Received from an alpha facility?		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present			<input checked="" type="checkbox"/>	
Record cooler temperature in centigrade, as appropriate	<u>3°C</u>			<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	<input checked="" type="checkbox"/>			If No, provide comments below
RSA/COC provided and complete containing the following information?	[REDACTED]			
• Client name and client sample number	<input checked="" type="checkbox"/>			
• Date and time of sampling	<input checked="" type="checkbox"/>			
• Sampling location or origin	<input checked="" type="checkbox"/>			
• Container type, size, and number	<input checked="" type="checkbox"/>			
• Preservatives (if used) noted on the COC/RSA and sample bottles			<input checked="" type="checkbox"/>	
• Analysis request is clear	<input checked="" type="checkbox"/>			
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>			
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>			
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>			
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>			
Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.				
Samples acceptable for release? <u>yes</u> PQSC Initials <u>ALT</u> Date <u>10-3-16</u>				
If No, comment on communication and resolution:				
WRPS SHIP 280 RUN 120 WHL RUN 80 (40Hg, 40Hg) Acetonitrile 40				
Number of IH Samples Received:				
Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe: _____	1,2-Butadiene: <u>80</u>
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVCA: <u>40</u>	VOC: <u>40</u>	Other IH: _____

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

4130116 11-7-16
10/11/16

Contractor: Washington River Protection Solutions			Date Sampled: 10/11/16		
CACN: 202507		COA: C820		Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L			Phone: (509)373-4996		Turnaround: N/A
Return Report To: Caldwell, Joyce A			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
3167035111	16-08765-6-BASE-EFF / Hydrar (SKC 226-17-1A) * 3167035112 3167035113	Hg-Elemental Source 1			
3167035114	16-08765-6-BASE-IN / Hydrar (SKC 226-17-1A) * 3167035115 3167035116	Hg-Elemental Source 2			
3167035117	16-08765-6-BLANK1 / Hydrar (SKC 226-17-1A) * 3167035118 3167035119	Hg-Elemental Source 3			
3167035120	16-08765-6-BLANK2 / Hydrar (SKC 226-17-1A) * 3167035121 3167035122	Hg-Elemental Source 4			
3167035143	16-08765-6-EFF-A / Hydrar (SKC 226-17-1A) * 3167035144 3167035145	Hg-Elemental Source 5			
3167035146	16-08765-6-EFF-B / Hydrar (SKC 226-17-1A) * 3167035147 3167035148	Hg-Elemental Source 6			
3167035149	16-08765-6-EFF-C / Hydrar (SKC 226-17-1A) * 3167035150 3167035151	Hg-Elemental Source 7			
3167035152	16-08765-6-EFF-D / Hydrar (SKC 226-17-1A) * 3167035153 3167035154	Hg-Elemental Source 8			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:		Valerie Hendricks	310XHV/rom H104	10/11/16	0925
Retrieved from Storage:		BRETT GARNER		10-3-16	0730
	Signature	Printed Name	Date	Time	
Relinquished By:		BRETT GARNER	10-7-16	1040	
Received By:		DIANE TURNER	10-3-16	10:40	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Signature
Date: 10/11/16

Contractor: Washington River Protection Solutions		Date Sampled: 10/11/16
CACN: 202387	COA: C820	Survey No.: 16-08785 - Carriage Testing AN Stack - A Train
Contact Name: Jones, Parker L	Phone: (509)373-4998	Turnaround: N/A
Return Report To: Caldwell, Joyce A	MSIN: R1-08	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
5167035155	16-08785-8-EFF-E / Hydrar (SKC 228-17-1A) 5167035156 5167035157	Hg-Elemental Source 9
5167035158	16-08785-8-EFF-F / Hydrar (SKC 228-17-1A) 5167035161 5167035162	Hg-Elemental Source 10
5167035163	16-08785-8-EFF-G / Hydrar (SKC 228-17-1A) 5167035164 5167035165	Hg-Elemental Source 11
5167035166	16-08785-8-EFF-H / Hydrar (SKC 228-17-1A) 5167035167 5167035168	Hg-Elemental Source 12
5167035169	16-08785-8-IN-A / Hydrar (SKC 228-17-1A) 5167035170 5167035171	Hg-Elemental Source 13
5167035172	16-08785-8-IN-B / Hydrar (SKC 228-17-1A) 5167035173 5167035174	Hg-Elemental Source 14
5167035175	16-08785-8-IN-C / Hydrar (SKC 228-17-1A) 5167035176 5167035177	Hg-Elemental Source 15
5167035178	16-08785-8-IN-D / Hydrar (SKC 228-17-1A) 5167035179 5167035180	Hg-Elemental Source 16

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	27094U m. 10/04	10/11/16	0925
Retrieved from Storage:	<i>[Signature]</i>	BRET GARNER		10-3-16	0720

	Signature	Printed Name	Date	Time
Relinquished By:	<i>[Signature]</i>	BRET GARNER	10-3-16	1040
Received By:	<i>[Signature]</i>	Dianne Turner	10-3-16	10:40
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

9/30/15 + 10/2/16
 RB
 Date Sampled: 10/1/16

Contractor: Washington River Protection Solutions		Date Sampled: 10/1/16	
CACN: 202347	COA: C830	Survey No.: 16-08765 - Carriage Testing AM Stack - A Train	
Contact Name: Jones, Parker L		Phone: (509)373-4955	Turnaround: N/A
Return Report To: Caldwell, Joyce A		MSIN: R1-08	Phone: (509)376-0737
Laboratory Log No	Sample ID/Type/Description	Required Analysis	
5167035181	16-08765-6-IN-E / Hydrar (SKC 226-17-1A) ² , 5167035182 5167035183	Hg-Elemental Source ⁰	
5167035184	16-08765-6-IN-F / Hydrar (SKC 226-17-1A) ² , 5167035185 5167035186	Hg-Elemental Source ¹⁵	
5167035187	16-08765-6-IN-G / Hydrar (SKC 226-17-1A) ² , 5167035188 5167035189	Hg-Elemental Source ¹⁷	
5167035190	16-08765-6-IN-H / Hydrar (SKC 226-17-1A) ² , 5167035191 5167035192	Hg-Elemental Source ²⁰	
16-08765-7-BASE-EFF / CISA (SKC 226-29)		NH3 Source	
16-08765-7-BASE-INT / CISA (SKC 226-29)		NH3 Source	
16-08765-7-BLANK1 / CISA (SKC 226-29)		NH3 Source	
16-08765-7-BLANK2 / CISA (SKC 226-29)		NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Diane Hendricks	2704 HWY rm 4104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-2-16
Received By:	<i>[Signature]</i>	Diane Hendricks	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AM Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4868	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
3167035273	16-08766-6-BASE-EFF / Hydrar (SKC 226-17-1A) 3167035354 3167035355	Hg-Elemental Source 21	
3167035356	16-08766-6-BASE-IN / Hydrar (SKC 226-17-1A) 3167035357 3167035358	Hg-Elemental Source 22	
3167035399	16-08766-6-BLANK-EFF / Hydrar (SKC 226-17-1A) 3167035400 3167035401	Hg-Elemental Source 23	
3167035402	16-08766-6-BLANK-IN / Hydrar (SKC 226-17-1A) 3167035403 3167035404	Hg-Elemental Source 24	
3167035405	16-08766-6-EFF-A / Hydrar (SKC 226-17-1A) 3167035406 3167035407	Hg-Elemental Source 25	
3167035408	16-08766-6-EFF-B / Hydrar (SKC 226-17-1A) 3167035409 3167035410	Hg-Elemental Source 26	
3167035411	16-08766-6-EFF-C / Hydrar (SKC 226-17-1A) 3167035412 3167035413	Hg-Elemental Source 27	
3167035504	16-08766-6-EFF-D / Hydrar (SKC 226-17-1A) 3167035505 3167035506	Hg-Elemental Source 28	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Wesley Hendricks	2704 HV rm H104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

10/2/16
Brett Garner

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202367	COA: C820	Survey No.: 16-08766 - Cartridge Testing AM Stack - A Train	
Contact Name: Jones, Parker L		Phone: (509)373-4968	Turnaround: N/A
Return Report To: Caldwell, Joyce A		MSIN: #1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
5167035517	16-08766-6-EFF-E / Hydrar (SKC 226-17-1A) 5167035528 5167035529	Hg-Elemental Source 29	
5167035540	16-08766-6-EFF-F / Hydrar (SKC 226-17-1A) 5167035541 5167035542	Hg-Elemental Source 30	
5167035553	16-08766-6-EFF-G / Hydrar (SKC 226-17-1A) 5167035554 5167035555	Hg-Elemental Source 31	
5167035727	16-08766-6-EFF-H / Hydrar (SKC 226-17-1A) 5167035728 5167035729	Hg-Elemental Source 32	
5167035730	16-08766-6-IN-A / Hydrar (SKC 226-17-1A) 5167035731 5167035732	Hg-Elemental Source 33	
5167035735	16-08766-6-IN-B / Hydrar (SKC 226-17-1A) 5167035736 5167035737	Hg-Elemental Source 34	
5167035738	16-08766-6-IN-C / Hydrar (SKC 226-17-1A) 5167035739 5167035740	Hg-Elemental Source 35	
5167035741	16-08766-6-IN-D / Hydrar (SKC 226-17-1A) 5167035742 5167035743	Hg-Elemental Source 36	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704HV -m1104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
GACN: 202967	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4968	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
3167035744	16-08766-6-IN-E / Hydrar (SKC 226-17-1A) 3167035745 3167035746	Hg-Elemental Source J7	
3167035747	16-08766-6-IN-F / Hydrar (SKC 226-17-1A) 3167035748 3167035749	Hg-Elemental Source J8	
3167035750	16-08766-6-IN-G / Hydrar (SKC 226-17-1A) 3167035751 3167035752	Hg-Elemental Source J9	
3167035754	16-08766-6-IN-H / Hydrar (SKC 226-17-1A) 3167035757 3167035758	Hg-Elemental Source J9	
16-08766-7-BASE-EFF / CISA (SKC 226-29)		NH3 Source	
16-08766-7-BASE-IN / CISA (SKC 226-29)		NH3 Source	
16-08766-7-BLANK-EFF / CISA (SKC 226-29)		NH3 Source	
16-08766-7-BLANK-IN / CISA (SKC 226-29)		NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendrick	2104HV rmH104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-3-16
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TANESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

**FINAL REPORT ON AMMONIA VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 – 2, 2016**

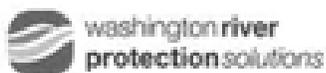
Document No.: 20163048 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
November 2, 2016



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November 2, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON AMMONIA VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 - 2, 2016**

This final report presents the results of forty ammonia vapor tubes received at the 222-S Laboratory on October 3, 2016, in good condition and with adequate paperwork. The samples were logged into sample delivery group 20163048.

DISCLAIMERS

- The information contained in this report is intended only for the use of the addressee and should be considered confidential.
- This report shall not be reproduced, except in full, without written approval of the laboratory.
- The results shown in this report pertain only to the actual samples tested.
- These results conform to the requirements specified in the referenced methods/procedures and specifications provided verbally or electronically by the customer. Any deviations or modifications are discussed in the following narrative.
- This report only addresses laboratory activities related to the listed surveys. Requirements or anomalies concerning field sampling are not addressed in this report.

PROCEDURES

Method	Preparation Procedure	Analysis Procedure
Ammonia by OSHA ID-188	LA-533-117, Rev. 3-1	LA-503-157, Rev. 2-6

ANALYTICAL SUMMARY

The vapor tubes were tested for ammonia, as specified on the chain of custody. Standard laboratory procedures for ion chromatography were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory (QAPP)*. Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control samples (LCS). The results of 373 LCS determinations indicate a mean recovery of 98% with a standard deviation of 3.3%. Statistical process control limits for the LCS are 80 - 120%, with no significant bias. The overall estimate of uncertainty is 6.7%, with coverage factor (k) = 2.

Due to background levels of ammonium (or interfering compounds) that are typically present in the media used in the sorbent tubes for collecting the vapor samples, positive results are obtained for the preparation blank. Laboratories typically correct the LCS and all field samples for these background levels, when detected. However, per agreement with the customer, no blank subtraction was performed. The client-requested reporting limit is 10 µg per sample, which makes the analysis of additional blanks and subsequent blank subtraction unnecessary. It is the

laboratory's opinion that including the media contribution, which is well below the client's requested reporting limit, provides results that are more conservative than when blank subtractions are performed. Twenty-six of the forty ammonia results for sample group 20163048 were above the reporting limit of 10 µg per sample. For these samples, the total result includes the contribution from the back resin portion even though the back resin portion result is lower than the reporting limit (see Attachment 1).

20163048 Rev. 0

Attachment 1

DATA SUMMARY REPORT

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C.298

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-7-BASE-EFF	Total	S16T03587	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BASE-EFF	Front Resin	S16T03588	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-EFF	Back Resin	S16T03589	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Total	S16T03590	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Front Resin	S16T03591	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Back Resin	S16T03592	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK1	Total	S16T03593	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BLANK1	Front Resin	S16T03594	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK1	Back Resin	S16T03595	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK2	Total	S16T03596	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BLANK2	Front Resin	S16T03598	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK2	Back Resin	S16T03599	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-A	Total	S16T035604	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-A	Front Resin	S16T035637	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-A	Back Resin	S16T035639	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-B	Total	S16T035642	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-B	Front Resin	S16T035643	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-B	Back Resin	S16T035644	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-C	Total	S16T035645	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-C	Front Resin	S16T035646	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-C	Back Resin	S16T035647	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-D	Total	S16T035648	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-D	Front Resin	S16T035649	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-D	Back Resin	S16T035650	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-E	Total	S16T035651	Ammonia	ug/sample	n/a	<10.0	22.8	10.0
16-08765-7-EFF-E	Front Resin	S16T035652	Ammonia	ug/sample	94.0	<10.0	22.9	10.0
16-08765-7-EFF-E	Back Resin	S16T035653	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-F	Total	S16T035654	Ammonia	ug/sample	n/a	<10.0	62.8	10.0
16-08765-7-EFF-F	Front Resin	S16T035655	Ammonia	ug/sample	94.0	<10.0	62.0	10.0
16-08765-7-EFF-F	Back Resin	S16T035656	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-G	Total	S16T035657	Ammonia	ug/sample	n/a	<10.0	71.4	10.0
16-08765-7-EFF-G	Front Resin	S16T035658	Ammonia	ug/sample	94.0	<10.0	70.7	10.0
16-08765-7-EFF-G	Back Resin	S16T035659	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-H	Total	S16T035660	Ammonia	ug/sample	n/a	<10.0	1.23	20.0
16-08765-7-EFF-H	Front Resin	S16T035661	Ammonia	ug/sample	94.0	<10.0	1.22	20.0
16-08765-7-EFF-H	Back Resin	S16T035662	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-A	Total	S16T035663	Ammonia	ug/sample	n/a	<10.0	498	100
16-08765-7-IN-A	Front Resin	S16T035664	Ammonia	ug/sample	94.0	<10.0	467	100
16-08765-7-IN-A	Back Resin	S16T035665	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-B	Total	S16T035666	Ammonia	ug/sample	n/a	<10.0	428	100
16-08765-7-IN-B	Front Resin	S16T035667	Ammonia	ug/sample	94.0	<10.0	428	10.0
16-08765-7-IN-B	Back Resin	S16T035668	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-C	Total	S16T035669	Ammonia	ug/sample	n/a	<10.0	512	100
16-08765-7-IN-C	Front Resin	S16T035670	Ammonia	ug/sample	94.0	<10.0	511	100
16-08765-7-IN-C	Back Resin	S16T035671	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-D	Total	S16T035672	Ammonia	ug/sample	n/a	<10.0	473	100
16-08765-7-IN-D	Front Resin	S16T035673	Ammonia	ug/sample	94.0	<10.0	473	100
16-08765-7-IN-D	Back Resin	S16T035674	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08766-7-IN-B	Total	S16T035675	Ammonia	ug/sample	n/a	<10.0	400	100
16-08766-7-IN-B	Front Resin	S16T035676	Ammonia	ug/sample	94.0	<10.0	400	100
16-08766-7-IN-B	Back Resin	S16T035677	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08766-7-IN-F	Total	S16T035678	Ammonia	ug/sample	n/a	<10.0	44.7	10.0
16-08766-7-IN-F	Front Resin	S16T035679	Ammonia	ug/sample	100	<10.0	44.1	10.0
16-08766-7-IN-F	Back Resin	S16T035680	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-G	Total	S16T035681	Ammonia	ug/sample	n/a	<10.0	46.3	10.0
16-08766-7-IN-G	Front Resin	S16T035682	Ammonia	ug/sample	100	<10.0	45.1	10.0
16-08766-7-IN-G	Back Resin	S16T035683	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-H	Total	S16T035684	Ammonia	ug/sample	n/a	<10.0	534	100
16-08766-7-IN-H	Front Resin	S16T035685	Ammonia	ug/sample	100	<10.0	533	100
16-08766-7-IN-H	Back Resin	S16T035686	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Total	S16T035687	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Front Resin	S16T035688	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Back Resin	S16T035689	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BASE-IN	Total	S16T035690	Ammonia	ug/sample	n/a	<10.0	10.3	10.0
16-08766-7-BASE-IN	Front Resin	S16T035691	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BASE-IN	Back Resin	S16T035692	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Total	S16T035693	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Front Resin	S16T035694	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Back Resin	S16T035695	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Total	S16T035696	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Front Resin	S16T035697	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Back Resin	S16T035698	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-A	Total	S16T035699	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-HPF-A	Front Resin	S16T035700	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-A	Back Resin	S16T035701	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-B	Total	S16T035702	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-HPF-B	Front Resin	S16T035703	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-B	Back Resin	S16T035704	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-C	Total	S16T035705	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-HPF-C	Front Resin	S16T035706	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-C	Back Resin	S16T035707	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-D	Total	S16T035708	Ammonia	ug/sample	n/a	<10.0	15.1	10.0
16-08766-7-HPF-D	Front Resin	S16T035709	Ammonia	ug/sample	100	<10.0	14.3	10.0
16-08766-7-HPF-D	Back Resin	S16T035710	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-E	Total	S16T035711	Ammonia	ug/sample	n/a	<10.0	25.3	10.0
16-08766-7-HPF-E	Front Resin	S16T035712	Ammonia	ug/sample	100	<10.0	24.7	10.0
16-08766-7-HPF-E	Back Resin	S16T035713	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-F	Total	S16T035714	Ammonia	ug/sample	n/a	<10.0	49.1	10.0
16-08766-7-HPF-F	Front Resin	S16T035715	Ammonia	ug/sample	100	<10.0	48.2	10.0
16-08766-7-HPF-F	Back Resin	S16T035716	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-G	Total	S16T035717	Ammonia	ug/sample	n/a	<10.0	84.3	10.0
16-08766-7-HPF-G	Front Resin	S16T035718	Ammonia	ug/sample	100	<10.0	83.2	10.0
16-08766-7-HPF-G	Back Resin	S16T035719	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-HPF-H	Total	S16T035720	Ammonia	ug/sample	n/a	<10.0	148	50.0
16-08766-7-HPF-H	Front Resin	S16T035721	Ammonia	ug/sample	100	<10.0	147	50.0
16-08766-7-HPF-H	Back Resin	S16T035722	Ammonia	ug/sample	100	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08766-7-IN-A	Total	S16T035723	Ammonia	ug/sample	n/a	<10.0	473	100
16-08766-7-IN-A	Front Resin	S16T035724	Ammonia	ug/sample	100	<10.0	472	100
16-08766-7-IN-A	Back Resin	S16T035725	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-B	Total	S16T035726	Ammonia	ug/sample	n/a	<10.0	513	100
16-08766-7-IN-B	Front Resin	S16T035733	Ammonia	ug/sample	100	<10.0	512	100
16-08766-7-IN-B	Back Resin	S16T035734	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-C	Total	S16T035733	Ammonia	ug/sample	n/a	<10.0	490	100
16-08766-7-IN-C	Front Resin	S16T035735	Ammonia	ug/sample	100	<10.0	491	100
16-08766-7-IN-C	Back Resin	S16T035736	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-D	Total	S16T035739	Ammonia	ug/sample	n/a	<10.0	519	100
16-08766-7-IN-D	Front Resin	S16T035740	Ammonia	ug/sample	100	<10.0	518	100
16-08766-7-IN-D	Back Resin	S16T035761	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-E	Total	S16T035762	Ammonia	ug/sample	n/a	<10.0	472	100
16-08766-7-IN-E	Front Resin	S16T035763	Ammonia	ug/sample	97.4	<10.0	471	100
16-08766-7-IN-E	Back Resin	S16T035764	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-F	Total	S16T035765	Ammonia	ug/sample	n/a	<10.0	528	100
16-08766-7-IN-F	Front Resin	S16T035766	Ammonia	ug/sample	97.4	<10.0	527	100
16-08766-7-IN-F	Back Resin	S16T035767	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-G	Total	S16T035768	Ammonia	ug/sample	n/a	<10.0	473	100
16-08766-7-IN-G	Front Resin	S16T035769	Ammonia	ug/sample	97.4	<10.0	472	100
16-08766-7-IN-G	Back Resin	S16T035770	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-H	Total	S16T035771	Ammonia	ug/sample	n/a	<10.0	521	100
16-08766-7-IN-H	Front Resin	S16T035772	Ammonia	ug/sample	97.4	<10.0	520	100
16-08766-7-IN-H	Back Resin	S16T035773	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0

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Attachment 2

ANALYSIS DATE REPORT

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ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163048

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T03588	16-08765-7-BASE-EFF	Ammonia	10/06/2016 17:00	10/07/2016 00:37
S16T03589	16-08765-7-BASE-EFF	Ammonia	10/06/2016 17:00	10/07/2016 01:00
S16T03591	16-08765-7-BASE-IN	Ammonia	10/06/2016 17:00	10/07/2016 02:33
S16T03592	16-08765-7-BASE-IN	Ammonia	10/06/2016 17:00	10/07/2016 02:56
S16T03594	16-08765-7-BLANK1	Ammonia	10/06/2016 17:00	10/07/2016 03:19
S16T03595	16-08765-7-BLANK1	Ammonia	10/06/2016 17:00	10/07/2016 03:42
S16T03598	16-08765-7-BLANK2	Ammonia	10/06/2016 17:00	10/07/2016 04:05
S16T03599	16-08765-7-BLANK2	Ammonia	10/06/2016 17:00	10/07/2016 04:29
S16T03607	16-08765-7-EFF-A	Ammonia	10/06/2016 17:00	10/07/2016 04:52
S16T03609	16-08765-7-EFF-A	Ammonia	10/06/2016 17:00	10/07/2016 05:15
S16T03643	16-08765-7-EFF-B	Ammonia	10/06/2016 17:00	10/07/2016 05:38
S16T03644	16-08765-7-EFF-B	Ammonia	10/06/2016 17:00	10/07/2016 06:01
S16T03646	16-08765-7-EFF-C	Ammonia	10/06/2016 17:00	10/07/2016 07:34
S16T03647	16-08765-7-EFF-C	Ammonia	10/06/2016 17:00	10/07/2016 07:57
S16T03649	16-08765-7-EFF-D	Ammonia	10/06/2016 17:00	10/07/2016 08:20
S16T03650	16-08765-7-EFF-D	Ammonia	10/06/2016 17:00	10/07/2016 08:43
S16T03652	16-08765-7-EFF-E	Ammonia	10/06/2016 17:00	10/07/2016 11:48
S16T03653	16-08765-7-EFF-E	Ammonia	10/06/2016 17:00	10/07/2016 12:12
S16T03655	16-08765-7-EFF-F	Ammonia	10/06/2016 17:00	10/07/2016 12:35
S16T03656	16-08765-7-EFF-F	Ammonia	10/06/2016 17:00	10/07/2016 12:58
S16T03658	16-08765-7-EFF-G	Ammonia	10/06/2016 17:00	10/07/2016 13:21
S16T03659	16-08765-7-EFF-G	Ammonia	10/06/2016 17:00	10/07/2016 13:44
S16T03661	16-08765-7-EFF-H	Ammonia	10/06/2016 17:00	10/10/2016 13:20
S16T03662	16-08765-7-EFF-H	Ammonia	10/06/2016 17:00	10/07/2016 15:40
S16T03664	16-08765-7-IN-A	Ammonia	10/06/2016 17:00	10/10/2016 13:43
S16T03665	16-08765-7-IN-A	Ammonia	10/06/2016 17:00	10/07/2016 16:26
S16T03667	16-08765-7-IN-B	Ammonia	10/06/2016 17:00	10/10/2016 13:06
S16T03668	16-08765-7-IN-B	Ammonia	10/06/2016 17:00	10/07/2016 17:12
S16T03670	16-08765-7-IN-C	Ammonia	10/06/2016 17:00	10/10/2016 13:29
S16T03671	16-08765-7-IN-C	Ammonia	10/06/2016 17:00	10/07/2016 17:39
S16T03673	16-08765-7-IN-D	Ammonia	10/06/2016 17:00	10/10/2016 13:52
S16T03674	16-08765-7-IN-D	Ammonia	10/06/2016 17:00	10/07/2016 18:45
S16T03676	16-08765-7-IN-E	Ammonia	10/06/2016 17:00	10/10/2016 14:13
S16T03677	16-08765-7-IN-E	Ammonia	10/06/2016 17:00	10/07/2016 20:41
S16T03679	16-08765-7-IN-F	Ammonia	10/14/2016 09:00	10/14/2016 17:39
S16T03680	16-08765-7-IN-F	Ammonia	10/14/2016 09:00	10/14/2016 18:22
S16T03682	16-08765-7-IN-G	Ammonia	10/14/2016 09:00	10/14/2016 18:45
S16T03683	16-08765-7-IN-G	Ammonia	10/14/2016 09:00	10/14/2016 19:08
S16T03685	16-08765-7-IN-H	Ammonia	10/14/2016 09:00	10/17/2016 13:57
S16T03686	16-08765-7-IN-H	Ammonia	10/14/2016 09:00	10/14/2016 19:55
S16T03688	16-08766-7-BASE-EFF	Ammonia	10/14/2016 09:00	10/14/2016 21:27
S16T03689	16-08766-7-BASE-EFF	Ammonia	10/14/2016 09:00	10/14/2016 21:50
S16T03691	16-08766-7-BASE-IN	Ammonia	10/14/2016 09:00	10/14/2016 22:14
S16T03692	16-08766-7-BASE-IN	Ammonia	10/14/2016 09:00	10/14/2016 22:37
S16T03694	16-08766-7-BLANK-EFF	Ammonia	10/14/2016 09:00	10/14/2016 23:00
S16T03695	16-08766-7-BLANK-EFF	Ammonia	10/14/2016 09:00	10/14/2016 23:23

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163048

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035697	16-08766-7-BLANK-IN	Ammonia	10/14/2016 09:00	10/14/2016 23:46
S16T035698	16-08766-7-BLANK-IN	Ammonia	10/14/2016 09:00	10/15/2016 00:09
S16T035700	16-08766-7-IPP-A	Ammonia	10/14/2016 09:00	10/15/2016 00:32
S16T035701	16-08766-7-IPP-A	Ammonia	10/14/2016 09:00	10/15/2016 00:56
S16T035703	16-08766-7-IPP-B	Ammonia	10/14/2016 09:00	10/19/2016 16:46
S16T035704	16-08766-7-IPP-B	Ammonia	10/14/2016 09:00	10/19/2016 17:09
S16T035706	16-08766-7-IPP-C	Ammonia	10/14/2016 09:00	10/19/2016 17:33
S16T035707	16-08766-7-IPP-C	Ammonia	10/14/2016 09:00	10/19/2016 17:56
S16T035709	16-08766-7-IPP-D	Ammonia	10/14/2016 09:00	10/19/2016 21:04
S16T035710	16-08766-7-IPP-D	Ammonia	10/14/2016 09:00	10/19/2016 21:24
S16T035712	16-08766-7-IPP-E	Ammonia	10/14/2016 09:00	10/19/2016 21:47
S16T035713	16-08766-7-IPP-E	Ammonia	10/14/2016 09:00	10/19/2016 22:10
S16T035715	16-08766-7-IPP-F	Ammonia	10/14/2016 09:00	10/19/2016 22:33
S16T035716	16-08766-7-IPP-F	Ammonia	10/14/2016 09:00	10/19/2016 22:57
S16T035718	16-08766-7-IPP-G	Ammonia	10/14/2016 09:00	10/15/2016 10:11
S16T035719	16-08766-7-IPP-G	Ammonia	10/14/2016 09:00	10/15/2016 10:34
S16T035721	16-08766-7-IPP-H	Ammonia	10/14/2016 09:00	10/17/2016 14:21
S16T035722	16-08766-7-IPP-H	Ammonia	10/14/2016 09:00	10/15/2016 11:21
S16T035724	16-08766-7-IN-A	Ammonia	10/14/2016 09:00	10/17/2016 14:44
S16T035725	16-08766-7-IN-A	Ammonia	10/14/2016 09:00	10/15/2016 12:07
S16T035733	16-08766-7-IN-B	Ammonia	10/14/2016 09:00	10/17/2016 15:07
S16T035734	16-08766-7-IN-B	Ammonia	10/14/2016 09:00	10/15/2016 12:53
S16T035735	16-08766-7-IN-C	Ammonia	10/14/2016 09:00	10/17/2016 15:30
S16T035736	16-08766-7-IN-C	Ammonia	10/14/2016 09:00	10/15/2016 13:39
S16T035760	16-08766-7-IN-D	Ammonia	10/14/2016 09:00	10/17/2016 15:53
S16T035761	16-08766-7-IN-D	Ammonia	10/14/2016 09:00	10/15/2016 15:35
S16T035763	16-08766-7-IN-E	Ammonia	10/17/2016 13:40	10/19/2016 17:24
S16T035764	16-08766-7-IN-E	Ammonia	10/17/2016 13:40	10/18/2016 14:48
S16T035766	16-08766-7-IN-F	Ammonia	10/17/2016 13:40	10/19/2016 17:47
S16T035767	16-08766-7-IN-F	Ammonia	10/17/2016 13:40	10/18/2016 15:34
S16T035769	16-08766-7-IN-G	Ammonia	10/17/2016 13:40	10/19/2016 18:10
S16T035770	16-08766-7-IN-G	Ammonia	10/17/2016 13:40	10/18/2016 16:20
S16T035772	16-08766-7-IN-H	Ammonia	10/17/2016 13:40	10/19/2016 18:33
S16T035773	16-08766-7-IN-H	Ammonia	10/17/2016 13:40	10/18/2016 18:16

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Attachment 3

RECEIPT PAPERWORK

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VAPOR Pilot Project NH3

222-S		SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST			ATS-LO-090-101 Rev. 00-1	
Date Samples Received: <u>10-3-16</u>		Total Number of Samples: <u>480</u>		Group #: <u>20163048 - NH3</u>		
Sample Custodian: <u>Diana Swanson</u>		IH Technician: <u>Bob Swanson</u>		<u>10-3-16</u>		
Sample Custodian to Complete:						
Action	Yes	No	N/A	Comments		
RSR provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Verify COC is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File		
Received from an alpha facility?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release		
Check that outer custody seal is intact, if present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Record cooler temperature in centigrade, as appropriate	<u>3°C</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Check if no cooler and/or no ice		
Samples are intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If No, provide comments below		
RSA/COC provided and complete containing the following information?						
• Client name and client sample number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Date and time of sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Sampling location or origin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Container type, size, and number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Preservatives (if used) noted on the COC/RSA and sample bottles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
• Analysis request is clear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.						
Samples acceptable for release? <u>yes</u> PC/SC Initials <u>AK</u> Date <u>10-3-16</u>						
If No, comment on communication and resolution:						
WRPS SHIP 280 RUN 120 WHL RUN 80 (40NH ₃ , 40H ₂) Aceton, tr, l, c 40						
Number of IH Samples Received:						
Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____		
Beryllium: _____	Bi-Bulk: _____	Bi-Fiber: _____	Bi-Wipe: _____	1,2-Butadiene: <u>80</u>		
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>		
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVOC: <u>40</u>	VOC: <u>40</u>	Other-IH: _____		

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

9/30/16
10/1/16

Contractor: Washington River Protection Solutions		Date Sampled: 10/1/16
CACN: 202307	COA: C820	Survey No.: 16-08765 - Cartridge Testing AM Stack - A Train
Contact Name: Jones, Parker L	Phone: (509)373-4968	Turnaround: N/A
Return Report To: Caldwell, Joyce A	MSIN: #1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis
 	16-08765-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
 	16-08765-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
 	16-08765-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
 	16-08765-6-IN-H / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
SI6T035587	16-08765-7-BASE-EFF / CISA (SKC 226-29) * - SI6T035588 35589	NH3 Source
SI6T035590	16-08765-7-BASE-IN / CISA (SKC 226-29) * - SI6T035591 35592	NH3 Source
SI6T035593	16-08765-7-BLANK1 / CISA (SKC 226-29) * - SI6T035594 35595	NH3 Source
SI6T035596	16-08765-7-BLANK2 / CISA (SKC 226-29) * - SI6T035598 35599	NH3 Source
Special Instructions:		
	Signature	Printed Name
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks
Retrieved from Storage:	<i>[Signature]</i>	BRET GARNER
	Location	Date
	2704HU room 41104	10/1/16
		10-3-16
	Time	
	0425	
	0729	
	Signature	Printed Name
Relinquished By:	<i>[Signature]</i>	BRET GARNER
Received By:	<i>[Signature]</i>	DIANNE TURNER
Relinquished By:		
Received By:		
Relinquished By:		
Received By:		
Additional Comments:		

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

9/27/16 → 10/28/16

Contractor: Washington River Protection Solutions			Date Sampled: 10/11/16		
CACN: 202367	COA: C820	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train			
Contact Name: Jones, Parker L		Phone: (509)375-4998		Turnaround: N/A	
Return Report To: Caldwell, Joyce A			MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
516T035640	16-08765-7-EFF-A / CISA (SKC 226-29) * 516T035637 35639	NH3 Source			
516T035642	16-08765-7-EFF-B / CISA (SKC 226-29) * 516T035643 35644	NH3 Source			
516T035643	16-08765-7-EFF-C / CISA (SKC 226-29) * 516T035646 35647	NH3 Source			
516T035648	16-08765-7-EFF-D / CISA (SKC 226-29) * 516T035649 35650	NH3 Source			
516T035651	16-08765-7-EFF-E / CISA (SKC 226-29) * 516T035652 35653	NH3 Source			
516T035654	16-08765-7-EFF-F / CISA (SKC 226-29) * 516T035655 35656	NH3 Source			
516T035657	16-08765-7-EFF-G / CISA (SKC 226-29) * 516T035658 35659	NH3 Source			
516T035660	16-08765-7-EFF-H / CISA (SKC 226-29) * 516T035661 35662	NH3 Source			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Valerie Handrick	2204HN com H104	10/11/16	0425
Retrieved from Storage:	<i>[Signature]</i>	BRET GARNER		10-3-16	0729
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	BRET GARNER	10-3-16	1040	
Received By:	<i>[Signature]</i>	Dianne Turace	10-3-16	1240	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

4/26/16 10:16
10/1/16

Contractor: Washington River Protection Solutions			Date Sampled: 10/1/16		
CACN: 302387		COA: C820		Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L			Phone: (509)373-4996		Turnaround: N/A
Return Report To: Caldwell, Joyce A			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
S16T035663	16-08765-7-IN-A / CISA (SKC 228-29)* S16T035664 35665	NH3 Source			
S16T035666	16-08765-7-IN-B / CISA (SKC 228-29)* S16T035667 35668	NH3 Source			
S16T035669	16-08765-7-IN-C / CISA (SKC 228-29)* S16T035670 35671	NH3 Source			
S16T035672	16-08765-7-IN-D / CISA (SKC 228-29)* S16T035673 35674	NH3 Source			
S16T035675	16-08765-7-IN-E / CISA (SKC 228-29)* S16T035676 35677	NH3 Source			
S16T035678	16-08765-7-IN-F / CISA (SKC 228-29)* S16T035679 35680	NH3 Source			
S16T035681	16-08765-7-IN-G / CISA (SKC 228-29)* S16T035682 35683	NH3 Source			
S16T035684	16-08765-7-IN-H / CISA (SKC 228-29)* S16T035685 35686	NH3 Source			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	EMPHV east H04	10/1/16	15:25
Retrieved from Storage:	<i>[Signature]</i>	BRET GARNER		10-3-16	07:29
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	BRET GARNER	10-3-16	7:04	
Received By:	<i>[Signature]</i>	Diane Turner	10-3-16	10:40	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

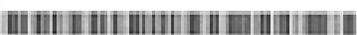
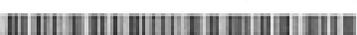
INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

PL
10-3-16

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202307	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4666	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
 	16-08766-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
 	16-08766-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
 	16-08766-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
 	16-08766-6-IN-H / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
<i>516T035687</i>	16-08766-7-BASE-EFF / CISA (SKC 226-29)	<i>516T035688</i> <i>35689</i>	NH3 Source
<i>516T035690</i>	16-08766-7-BASE-IN / CISA (SKC 226-29)	<i>516T035691</i> <i>35692</i>	NH3 Source
<i>516T035693</i>	16-08766-7-BLANK-EFF / CISA (SKC 226-29)	<i>516T035694</i> <i>35695</i>	NH3 Source
<i>516T035696</i>	16-08766-7-BLANK-IN / CISA (SKC 226-29)	<i>516T035697</i> <i>35698</i>	NH3 Source
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	27044V cmH104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-3-16
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

10/11/16 1-3-16
RL

Contractor: Washington River Protection Solutions		Date Sampled: <i>10/2/16</i>	
CACN: 202387	COA: 0809	Survey No.: 16-08786 - Cartridge Testing AM Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4996	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
<i>S16T035699</i>	16-08786-7-EFF-A / CISA (SKC 226-29)  <i>S16T035700</i> <i>35701</i>	NH3 Source	
<i>S16T035702</i>	16-08786-7-EFF-B / CISA (SKC 226-29)  <i>S16T035703</i> <i>35704</i>	NH3 Source	
<i>S16T035705</i>	16-08786-7-EFF-C / CISA (SKC 226-29)  <i>S16T035706</i> <i>35707</i>	NH3 Source	
<i>S16T035708</i>	16-08786-7-EFF-D / CISA (SKC 226-29)  <i>S16T035709</i> <i>35710</i>	NH3 Source	
<i>S16T035711</i>	16-08786-7-EFF-E / CISA (SKC 226-29)  <i>S16T035712</i> <i>35713</i>	NH3 Source	
<i>S16T035714</i>	16-08786-7-EFF-F / CISA (SKC 226-29)  <i>S16T035715</i> <i>35716</i>	NH3 Source	
<i>S16T035717</i>	16-08786-7-EFF-G / CISA (SKC 226-29)  <i>S16T035718</i> <i>35719</i>	NH3 Source	
<i>S16T035720</i>	16-08786-7-EFF-H / CISA (SKC 226-29)  <i>S16T035721</i> <i>35722</i>	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2104HN rom H104
Retrieved from Storage:	<i>[Signature]</i>	Brett Garner	
	Date	Time	
	<i>10/2/16</i>	<i>0730</i>	
	<i>10-3-16</i>	<i>0751</i>	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERRIA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 10/2/16		
CACN: 202987		COA: C800		Survey No.: 16-08766 - Cartridge Testing AM Stack - A Train	
Contact Name: Jones, Parker L			Phone: (509)373-4966		Turnaround: N/A
Return Report To: Caldwell, Joyce A			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
S16T035723	16-08766-7-IN-A / CISA (SKC 226-29) S16T035724 35725	NH3 Source			
S16T035726	16-08766-7-IN-B / CISA (SKC 226-29) S16T035733 35734	NH3 Source			
S16T035753	16-08766-7-IN-C / CISA (SKC 226-29) S16T035755 35756	NH3 Source			
S16T035759	16-08766-7-IN-D / CISA (SKC 226-29) S16T035760 35761	NH3 Source			
S16T035762	16-08766-7-IN-E / CISA (SKC 226-29) S16T035763 35764	NH3 Source			
S16T035765	16-08766-7-IN-F / CISA (SKC 226-29) S16T035766 35767	NH3 Source			
S16T035768	16-08766-7-IN-G / CISA (SKC 226-29) S16T035769 35770	NH3 Source			
S16T035771	16-08766-7-IN-H / CISA (SKC 226-29) S16T035772 35773	NH3 Source			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Valente Hernandez	2704 HV on H104	10/2/16	0430
Retrieved from Storage:	<i>[Signature]</i>	BRETT GALNER		10-3-16	0756
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	BRETT GALNER	10-3-16	1040	
Received By:	<i>[Signature]</i>	TARISA FORRESTER	10-3-16	1040	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					



ANALYTICAL REPORT

Report Date: October 12, 2018

Robert (Buddy) Sosa
Washington River Protection So
PO Box 850, MSIN T8-02
Richland, WA 99052

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov
20163058

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S18T035234	Collected: 10/01/2018			
Lab ID: 1627925001	Received: 10/06/2018			
Method: EPA TO-11A	Medic: SKC 228-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Sampling Parameter: Air Volume Not Provided				
Sampling Location: CARTRIDGE EVALUATION	Analyzed: 10/07/2018			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.14	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S18T035235	Collected: 10/01/2018			
Lab ID: 1627925002	Received: 10/06/2018			
Method: EPA TO-11A	Medic: SKC 228-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Sampling Parameter: Air Volume Not Provided				
Sampling Location: CARTRIDGE EVALUATION	Analyzed: 10/07/2018			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.099	NA	NA	0.050
Acetaldehyde	0.096	NA	NA	0.050

Results Continued on Next Page

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RIGHT SCALE FRONT RIGHT PART 1188



ANALYTICAL REPORT

Workorder: 34-1627925
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035235		Collected: 10/01/2016		
Lab ID: 1627925002		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Acetone	0.20	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.090	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035236		Collected: 10/01/2016		
Lab ID: 1627925003		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.057	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035237		Collected: 10/01/2016		
Lab ID: 1627925004		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.13	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035238		Collected: 10/01/2016		
Lab ID: 1627925005		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.053	NA	NA	0.050
Acetaldehyde	0.32	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035238		Collected: 10/01/2016	
Lab ID: 1627925006		Received: 10/05/2016	
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA 0.050

Sample ID: S16T035239		Collected: 10/01/2016	
Lab ID: 1627925006		Received: 10/05/2016	
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Formaldehyde	<0.050	NA	NA 0.050
Acetaldehyde	0.29	NA	NA 0.050
Acetone	0.14	NA	NA 0.050
Acrolein	<0.050	NA	NA 0.050
Propionaldehyde	<0.050	NA	NA 0.050
Crotonaldehyde	<0.050	NA	NA 0.050
Butyraldehyde	<0.050	NA	NA 0.050
Benzaldehyde	<0.050	NA	NA 0.050
Isovaleraldehyde	<0.050	NA	NA 0.050
Valeraldehyde	<0.050	NA	NA 0.050
m-Tolualdehyde	<0.050	NA	NA 0.050
p-Tolualdehyde	<0.050	NA	NA 0.050
o-Tolualdehyde	<0.050	NA	NA 0.050
Hexanal	<0.050	NA	NA 0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA 0.050

Sample ID: S16T035240		Collected: 10/01/2016	
Lab ID: 1627925007		Received: 10/05/2016	
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm) RL (ug/sample)
Formaldehyde	0.054	NA	NA 0.050
Acetaldehyde	0.36	NA	NA 0.050
Acetone	0.062	NA	NA 0.050
Acrolein	<0.050	NA	NA 0.050
Propionaldehyde	<0.050	NA	NA 0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035240	Collected: 10/01/2016			
Lab ID: 1627925007	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035241	Collected: 10/01/2016			
Lab ID: 1627925008	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	0.17	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035242		Collected: 10/01/2016		
Lab ID: 1627925009		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.33	NA	NA	0.050
Acetone	0.36	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035243		Collected: 10/01/2016		
Lab ID: 1627925010		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.060	NA	NA	0.050
Acetaldehyde	0.37	NA	NA	0.050
Acetone	0.43	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035243		Collected: 10/01/2016		
Lab ID: 1627925010		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035244		Collected: 10/01/2016		
Lab ID: 1627925011		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.28	NA	NA	0.050
Acetone	0.055	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035245		Collected: 10/01/2016		
Lab ID: 1627925012		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.35	NA	NA	0.050
Acetone	0.095	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035245	Collected: 10/01/2016			
Lab ID: 1627925012	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035246	Collected: 10/01/2016			
Lab ID: 1627925013	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.37	NA	NA	0.050
Acetaldehyde	0.61	NA	NA	0.050
Acetone	0.94	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.12	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.16	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035247	Collected: 10/01/2016			
Lab ID: 1627925014	Received: 10/05/2016			
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016	
Sampling Location: CARTRIDGE EVALUATION				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.12	NA	NA	0.050
Acetaldehyde	0.59	NA	NA	0.050
Acetone	0.63	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.11	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.084	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035248	Collected: 10/01/2016			
Lab ID: 1627925015	Received: 10/05/2016			
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016	
Sampling Location: CARTRIDGE EVALUATION				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.16	NA	NA	0.050
Acetaldehyde	0.62	NA	NA	0.050
Acetone	0.68	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.13	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Repl
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035248		Collected: 10/01/2016		
Lab ID: 1627925015		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035249		Collected: 10/01/2016		
Lab ID: 1627925016		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.13	NA	NA	0.050
Acetaldehyde	0.00	NA	NA	0.050
Acetone	0.53	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.14	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.083	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.080	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035250		Collected: 10/01/2016		
Lab ID: 1627925017		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.083	NA	NA	0.050
Acetaldehyde	0.55	NA	NA	0.050
Acetone	0.57	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.12	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035250		Collected: 10/01/2016		
Lab ID: 1627925017	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.079	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.12	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035251		Collected: 10/01/2016		
Lab ID: 1627925018	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.19	NA	NA	0.050
Acetaldehyde	0.58	NA	NA	0.050
Acetone	0.59	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.12	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.092	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.067	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035252		Collected: 10/01/2016		
Lab ID: 1627925019		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Location: CARTRIDGE EVALUATION				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.058	NA	NA	0.050
Acetaldehyde	0.12	NA	NA	0.050
Acetone	0.35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.063	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035253		Collected: 10/01/2016		
Lab ID: 1627925020		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Location: CARTRIDGE EVALUATION				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.14	NA	NA	0.050
Acetaldehyde	0.57	NA	NA	0.050
Acetone	0.41	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.089	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.052	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Repl
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035253 Lab ID: 1627925020		Sampling Location: CARTRIDGE EVALUATION		Collected: 10/01/2016 Received: 10/05/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035254 Lab ID: 1627925021		Sampling Location: CARTRIDGE EVALUATION		Collected: 10/02/2016 Received: 10/05/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035255 Lab ID: 1627925022		Sampling Location: CARTRIDGE EVALUATION		Collected: 10/02/2016 Received: 10/05/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.052	NA	NA	0.050
Acetaldehyde	0.083	NA	NA	0.050
Acetone	0.30	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035255	Collected: 10/02/2016			
Lab ID: 1627925022	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035256	Collected: 10/02/2016			
Lab ID: 1627925023	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035257		Collected: 10/02/2016		
Lab ID: 1627925024		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.22	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035258		Collected: 10/02/2016		
Lab ID: 1627925025		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.063	NA	NA	0.050
Acetaldehyde	0.29	NA	NA	0.050
Acetone	0.23	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035258		Collected: 10/02/2016		
Lab ID: 1627925025		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035259		Collected: 10/02/2016		
Lab ID: 1627925026		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035260		Collected: 10/02/2016		
Lab ID: 1627925027		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.34	NA	NA	0.050
Acetone	0.12	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035260	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627925027				Received: 10/05/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035261	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627925028				Received: 10/05/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035262		Collected: 10/02/2016		
Lab ID: 1627925029		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.29	NA	NA	0.050
Acetone	0.060	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035263		Collected: 10/02/2016		
Lab ID: 1627925030		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.33	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035263		Collected: 10/02/2016		
Lab ID: 1627925030		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035264		Collected: 10/02/2016		
Lab ID: 1627925031		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.31	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035265		Collected: 10/02/2016		
Lab ID: 1627925032		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.30	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035265	Collected: 10/02/2016			
Lab ID: 1627925032	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035266	Collected: 10/02/2016			
Lab ID: 1627925032	Received: 10/05/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.33	NA	NA	0.050
Acetaldehyde	0.57	NA	NA	0.050
Acetone	0.24	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.10	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035267		Collected: 10/02/2016		
Lab ID: 1627925034		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.31	NA	NA	0.050
Acetaldehyde	0.58	NA	NA	0.050
Acetone	0.63	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.082	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.11	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035268		Collected: 10/02/2016		
Lab ID: 1627925035		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.093	NA	NA	0.050
Acetaldehyde	0.53	NA	NA	0.050
Acetone	0.66	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.10	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.090	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.088	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Repl
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035268		Collected: 10/02/2016		
Lab ID: 1627925036		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035269		Collected: 10/02/2016		
Lab ID: 1627925036		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.17	NA	NA	0.050
Acetaldehyde	0.55	NA	NA	0.050
Acetone	0.48	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.10	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.12	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035270		Collected: 10/02/2016		
Lab ID: 1627925037		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.088	NA	NA	0.050
Acetaldehyde	0.52	NA	NA	0.050
Acetone	0.40	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.11	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035270		Collected: 10/02/2016		
Lab ID: 1627925037	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.078	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.068	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035271		Collected: 10/02/2016		
Lab ID: 1627925038	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.079	NA	NA	0.050
Acetaldehyde	0.51	NA	NA	0.050
Acetone	0.48	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.087	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.096	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.058	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Rel9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035272		Collected: 10/02/2016		
Lab ID: 1627925039		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.081	NA	NA	0.050
Acetaldehyde	0.52	NA	NA	0.050
Acetone	0.49	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.094	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.066	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035586		Collected: 10/02/2016		
Lab ID: 1627925040		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyzed: 10/07/2016				
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.085	NA	NA	0.050
Acetaldehyde	0.56	NA	NA	0.050
Acetone	0.35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.098	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.090	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.055	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reil
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035588	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627925040				Received: 10/06/2016
Method: EPA TO-11A	Media: SKC 228-118, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Comments

Quality Control: EPA TO-11A - (HBN: 178643)

LMB 521641 was used to media blank correct LCS 521642, LCSD 521643 and field samples 001-020 for Acetone only.

LCS 521643/LCSD 521643: 2,5-Dimethylbenzaldehyde recovery is outside of established limits but within general laboratory limits within 10% recovery for both LCS/LCSD. No further action was taken. Historical limits have been submitted for review.

Quality Control: EPA TO-11A - (HBN: 178643)

LMB 521644 was used to media blank correct LCS 521645, LCSD 521646 and field samples for Acetone only.

LCS 521645/LCSD 521646: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.

Report Authorization: (eS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA TO-11A	/s/ Emilie Pratt 10/11/2016 13:44	/s/ Christopher Winter 10/12/2016 11:32

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1627926**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD/ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/testing/
	Nevada	UT00009	http://ndep.nv.gov/inside/lab/service.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 176	http://www.iowadnr.gov/inside/Civil/Regulatory/Water.aspx
	Texas (TNE)	T104704456-11-1	http://www.tceq.texas.gov/fieldqa/lab_accred_certif.html
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Kansas	E-104 95	http://www.kdhehs.gov/pol/index.html	
Industrial Hygiene	AHA LAP LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedlabs.org
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Lead Testing: CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
	Soil, Dust, Paint, Air AHA LAP LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclascorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
 ND = Not Detected, Testing result not detected above the LOD or LOQ.
 NA = Not Applicable.
 "" No result could be reported, see sample comments for details.
 < This testing result is less than the numerical value.
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical Performance
 Basis: ALS Laboratory Group

Preparation: NA
 Batch: NA
 Prepared By: NA

Analysis: EPA TO-11A
 Batch: LC12617 g-094 178042
 Analyzed By: Emilie Pratt

Blank

Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.129	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521643					LCS0: 521643				
Analyzed: 10/07/2016 06:00					Analyzed: 10/07/2016 06:00				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.95	3.00	97.8	97.8 118.0	2.98	99.2	1.63	0.0	20.0
Acetaldehyde	2.97	3.00	99.0	94.7 110.5	3.00	99.8	0.973	0.0	20.0
Acetone	3.08	3.00	102	89.2 119.9	3.13	104	1.71	0.0	20.0
Acrolein	2.91	3.00	97.0	83.5 120.2	2.92	97.3	0.377	0.0	20.0
Propionaldehyde	2.85	3.00	95.0	92.2 117.2	2.92	97.2	1.38	0.0	20.0
Crotonaldehyde	3.00	3.00	100	93.1 114.8	2.95	98.0	1.44	0.0	20.0
Butyraldehyde	2.85	3.00	94.9	88.8 120.8	2.80	93.4	1.58	0.0	20.0
Benzaldehyde	2.80	3.00	93.3	98.0 113.3	2.94	97.9	1.44	0.0	20.0
Isovaleraldehyde	3.08	3.00	102	95.4 121.8	3.08	102	0.292	0.0	20.0
Valeraldehyde	3.15	3.00	105	85.3 120.4	3.25	108	2.91	0.0	20.0
m-Tolualdehyde	3.05	3.00	102	80.9 118.0	3.13	104	2.48	0.0	20.0
p-Tolualdehyde	2.85	3.00	95.0	83.5 122.2	2.94	98.0	0.389	0.0	20.0
o-Tolualdehyde	2.90	3.00	96.7	91.8 111.4	2.95	97.7	1.24	0.0	20.0
Hexanal	3.14	3.00	105	85.4 127.0	3.29	110	4.82	0.0	20.0
2,5-Dimethylbenzaldehyde	2.70	3.00	90.0	99.8 118.7	2.75	91.7	1.65	0.0	20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: LC12617 (494: 178042)
Analyzed By: Emilie Pratt

Comments

UMB 521641 was used to media blank carried LCS 521642, LCSD 521643 and field samples 001-020 for Acetone only.

LCS 521643, CSD 521643: 2,5-Dimethylbenzylidene recovery is outside of established limits but within general laboratory limits within 10% recovery for both LCS/LCSD. No further action was taken. Historical limits have been submitted for review.

QC Report Authorization (eS is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
ES/Emilie Pratt 10/11/2016 12:52	CS/Christopher Winter 10/12/2016 11:21

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ★ - Result is above the calibration range

- EPO - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical Performance
 Basis: ALS Laboratory Group

Preparation: NA
 Batch: NA
 Prepared By: NA

Analysis: EPA TO-11A
 Batch: LC12616 (494: 178043)
 Analyzed By: Emilie Pratt

Blank

LMB: 521644
 Analyzed: 10/07/2016 00:00

Units: ug/sample

Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.134	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521645
 Analyzed: 10/07/2016 00:00

Dilution: 1

Units: ug/sample

LCSID: 521646
 Analyzed: 10/07/2016 00:00

Dilution: 1

Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Formaldehyde	2.95	3.00	98.2	97.8 118.0	2.98	99.3	3.75	0.0 20.0
Acetaldehyde	2.89	3.00	96.3	94.7 110.5	2.98	99.3	3.07	0.0 20.0
Acetone	2.99	3.00	99.6	99.2 119.9	3.15	105	5.25	0.0 20.0
Acrolein	2.79	3.00	93.1	83.5 120.2	2.93	97.6	4.76	0.0 20.0
Propionaldehyde	2.80	3.00	93.3	92.2 117.2	2.95	98.3	3.47	0.0 20.0
Crotonaldehyde	2.91	3.00	96.9	93.1 114.8	2.92	97.2	0.378	0.0 20.0
Butyraldehyde	2.79	3.00	92.9	98.8 120.8	2.88	96.0	3.14	0.0 20.0
Benzaldehyde	2.85	3.00	95.1	98.0 113.3	2.91	97.0	1.97	0.0 20.0
Isovaleraldehyde	2.97	3.00	99.0	95.4 121.6	3.07	102	3.18	0.0 20.0
Valeraldehyde	3.11	3.00	104	95.3 120.4	3.20	107	2.85	0.0 20.0
m-Tolualdehyde	2.86	3.00	95.3	90.9 118.8	3.13	104	8.92	0.0 20.0
p-Tolualdehyde	2.87	3.00	95.7	93.5 122.2	2.91	97.0	6.21	0.0 20.0
o-Tolualdehyde	2.82	3.00	94.0	91.6 111.4	2.95	98.3	4.14	0.0 20.0
Hexanal	3.20	3.00	107	95.4 127.0	3.28	109	2.58	0.0 20.0
2,5-Dimethylbenzaldehyde	2.71	3.00	90.4	99.8 118.7	2.70	90.0	0.407	0.0 20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: LC12618 (494: 178043)
Analyzed By: Emile Prost

Comments

UMD 521644 was used to media blank carried LCS 521645, LCSD 521646 and field samples for Acetone only.

LCS 521645, CSD 521646: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.

QC Report Authorization (S/ is an electronic signature that complies with 21 CFR Part 11)

Analyt	Peer Review
S/ Emile Prost 10/11/2016 13:44	S/ Christopher Winter 10/12/2016 11:32

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ★ - Result is above the calibration range

- EPO - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



WPM

1627925
 20140528
 Page 3 of 4

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: [Blank]
 Date: [Blank]
 Sample ID: [Blank]
 Location: [Blank]
 Requester Name: [Blank]
 Requester Title: [Blank]
 Requester Address: [Blank]
 Requester Phone: [Blank]
 Requester Email: [Blank]
 Date of Collection: [Blank]
 Time of Collection: [Blank]
 Method of Collection: [Blank]
 Date of Receipt: [Blank]
 Time of Receipt: [Blank]

Sample No.	LAB ID	Date	Time	Ma/Type Container	Sample Analysis	Preservation
1	11P0010014	06/18/14		11320A 00L	11320A 14-01101-0-0001-01F	11320 00 100
2	11P0010020	06/18/14		11320A 00L	11320A 14-01101-0-0001-02	11320 00 100
3	11P0010030	06/18/14		11320A 00L	11320A 14-01101-0-0001-03	11320 00 100
4	11P0010007	06/18/14		11320A 00L	11320A 14-01101-0-0001-04	11320 00 100
5	11P0010028	06/18/14		11320A 00L	11320A 14-01101-0-0001-05	11320 00 100
6	11P0010029	06/18/14		11320A 00L	11320A 14-01101-0-0001-06	11320 00 100
7	11P0010040	06/18/14		11320A 00L	11320A 14-01101-0-0001-07	11320 00 100
8	11P0010041	06/18/14		11320A 00L	11320A 14-01101-0-0001-08	11320 00 100
9	11P0010042	06/18/14		11320A 00L	11320A 14-01101-0-0001-09	11320 00 100
10	11P0010043	06/18/14		11320A 00L	11320A 14-01101-0-0001-10	11320 00 100

POSSIBLE SAMPLE HANDLING/STORAGE (List all known uses) YES NO
 11320 11-11A
 SPECIAL INSTRUCTIONS:
 Based on results to test for lead, PFAS and other
 metals, please contact the analyst at 11320 11-11A for email
 requests for additional testing and see for email
 Project # 11320 11-11A, Program # 11320

Requested by: [Blank]
 Date: [Blank]
 Requested by: [Blank]
 Date: [Blank]
 Requested by: [Blank]
 Date: [Blank]
 Requested by: [Blank]
 Date: [Blank]

Project Name: [Blank]
 Date/Time: 10/5/16 10:30
 Project Name: [Blank]
 Date/Time: [Blank]

Project Name: [Blank]
 Date/Time: 10/7/16 17:20
 Project Name: [Blank]
 Date/Time: [Blank]



ANALYTICAL REPORT

Report Date: October 12, 2016

Robert (Buddy) Sosa
Washington River Protection So
PO Box 850, MSN T8-02
Richland, WA 99352

Phone: (509) 373-1282

E-mail: robert_w_sosa@rl.gov
20163063

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Ref9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035414	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627932001				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035415	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627932002				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035416	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627932003				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035417	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627932004				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

ADDRESS: 160 West Lacey Drive, 541 Lake City, WA, 94123 USA | PHONE: +1 801 266-7700 | FAX: +1 801 266-9992
ALS GROUP USA, CORP. An ALS Limited Company

Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: 34-1627932
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: **34-1627932**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035423 Lab ID: 1627932010	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035424 Lab ID: 1627932011	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035425 Lab ID: 1627932012	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035426 Lab ID: 1627932013	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035427 Lab ID: 1627932014	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035428 Lab ID: 1627932015	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035429 Lab ID: 1627932016	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035430 Lab ID: 1627932017	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035431 Lab ID: 1627932018	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035432 Lab ID: 1627932019	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: 34-1627932
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.



ANALYTICAL REPORT

Workorder: 34-1627932
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: **34-1627932**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035443 Lab ID: 1627932030	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016 Received: 10/05/2016
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035444 Lab ID: 1627932031	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016 Received: 10/05/2016
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035445 Lab ID: 1627932032	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016 Received: 10/05/2016
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035446 Lab ID: 1627932033	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016 Received: 10/05/2016
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035447 Lab ID: 1627932034	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016 Received: 10/05/2016
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: 34-1627932
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).



ANALYTICAL REPORT

Workorder: **34-1627932**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Ref9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T005453	Collected: 10/01/2016			
Lab ID: 1627932040	Received: 10/05/2016			
Method: NIOSH 1624	Media: SAC 226-37 Sorbent Tube			
	Sampling Parameter: Air Volume Not Provided			
	Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Report Authorization (eS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1624	eS/ Fred Rajali 10/11/2016 22:21	eS/ Thomas J. Masolan 10/12/2016 07:58

Laboratory Contact Information

ALS Environmental
990 W Levoe Drive
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Phone: (801) 266-7700
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ANALYTICAL REPORT

Workorder: 34-1627932
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Ref9
Project Manager: Rand Potter

General Lab Comments:

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scope s) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Table with 4 columns: Testing Sector, Accreditation Body (Standard), Certificate Number, Website. Rows include Environmental, Industrial Hygiene, Lead Testing, and Dietary Supplements.

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627932

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7832 (HBN: 178101)
Analyzed By: Fred Rejali

Blank

MB: 521250
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521744
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521747
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521750
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521753
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521756
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521251					LCS-D: 521252				
Analyzed: 10/11/2016 00:00					Analyzed: 10/11/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0334	0.0342	97.7	78.0 - 117.6	0.0331	96.8	0.903	0.0	20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: **1627932**

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analyte: NIOSH 1024
Batch: IFID7532 (rDN: 178101)
Analyzed By: Fred Rajal

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCB: 521745 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521746 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
1,3-Dutadene	0.0365	0.0342	107	78.0 117.6	0.0365	107	0.00	0.0 20.0
LCB: 521748 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521749 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
1,3-Dutadene	0.0350	0.0342	102	78.0 117.6	0.0342	100	2.31	0.0 20.0
LCB: 521751 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521752 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
1,3-Dutadene	0.0330	0.0342	96.5	78.0 117.6	0.0350	100	5.88	0.0 20.0
LCB: 521754 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521755 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
1,3-Dutadene	0.0308	0.0308	100	78.0 117.6	0.0323	105	4.82	0.0 20.0
LCB: 521757 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521758 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
1,3-Dutadene	0.0304	0.0308	98.8	78.0 117.6	0.0312	101	2.52	0.0 20.0

QC Report Authorization (eS/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/s/ Fred Rajal 10/11/2016 22:21	/s/ Thomas J. Masoian 10/13/2016 07:58

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



ANALYTICAL REPORT

Report Date: October 12, 2016

Robert (Buddy) Sosa
Washington River Protection So
PO Box 850, MSN T8-02
Richland, WA 99352

Phone: (509) 373-1282

E-mail: robert_w_sosa@rl.gov
20163054

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Ref9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035454	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627930001				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035455	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627930002				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035456	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627930003				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035457	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627930004				Received: 10/05/2016
Method: MIOGH 1024	Media: SKC 226-37 Sorbent Tube			Analyzed: 10/11/2016
	Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

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ANALYTICAL REPORT

Workorder: 34-1627930
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Sample ID, Lab ID, Sampling Location, Method, Media, Sampling Parameter, Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Sample ID, Lab ID, Sampling Location, Method, Media, Sampling Parameter, Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Sample ID, Lab ID, Sampling Location, Method, Media, Sampling Parameter, Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Sample ID, Lab ID, Sampling Location, Method, Media, Sampling Parameter, Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Sample ID, Lab ID, Sampling Location, Method, Media, Sampling Parameter, Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: **34-1627930**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035463 Lab ID: 1627930010	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035464 Lab ID: 1627930011	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035465 Lab ID: 1627930012	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035466 Lab ID: 1627930013	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035467 Lab ID: 1627930014	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: 34-1627930
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a sub-table for Analyte (1,3-Butadiene) with columns for Result (mg/sample), Result (mg/m³), Result (ppm), and RL (mg/sample).



ANALYTICAL REPORT

Workorder: **34-1627930**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035473 Lab ID: 1627930020	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/02/2016 Received: 10/05/2016		
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035474 Lab ID: 1627930021	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/02/2016 Received: 10/05/2016		
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035475 Lab ID: 1627930022	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/02/2016 Received: 10/05/2016		
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035476 Lab ID: 1627930023	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/02/2016 Received: 10/05/2016		
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035477 Lab ID: 1627930024	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/02/2016 Received: 10/05/2016		
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: 34-1627930
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a table for Method: NIOSH 1624, Media: SKC 226-37 Sorbent Tube, and a table for Analyte: 1,3-Butadiene with results in mg/s, mg/m3, ppm, and RL.

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a table for Method: NIOSH 1624, Media: SKC 226-37 Sorbent Tube, and a table for Analyte: 1,3-Butadiene with results in mg/s, mg/m3, ppm, and RL.

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a table for Method: NIOSH 1624, Media: SKC 226-37 Sorbent Tube, and a table for Analyte: 1,3-Butadiene with results in mg/s, mg/m3, ppm, and RL.

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a table for Method: NIOSH 1624, Media: SKC 226-37 Sorbent Tube, and a table for Analyte: 1,3-Butadiene with results in mg/s, mg/m3, ppm, and RL.

Table with 3 columns: Sample ID/Lab ID, Sampling Location, Collected/Received dates. Includes a table for Method: NIOSH 1624, Media: SKC 226-37 Sorbent Tube, and a table for Analyte: 1,3-Butadiene with results in mg/s, mg/m3, ppm, and RL.



ANALYTICAL REPORT

Workorder: 34-1627930
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.

Table with 3 rows: Sample ID/Lab ID, Method, and Analyte results for 1,3-Butadiene.



ANALYTICAL REPORT

Workorder: **34-1627930**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035488 Lab ID: 1627930035	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035489 Lab ID: 1627930036	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035490 Lab ID: 1627930037	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035491 Lab ID: 1627930038	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035492 Lab ID: 1627930039	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/03/2016 Received: 10/05/2016		
Method: MIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided	Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Ref9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T005493	Collected: 10/02/2016			
Lab ID: 1627930040	Received: 10/05/2016			
Method: NIOSH 1624	Media: SAC 226-37 Sorbent Tube			
	Sampling Parameter: Air Volume Not Provided			
	Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Report Authorization (eS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1624	eS/ Fred Rajali 10/11/2016 22:21	eS/ Thomas J. Masolan 10/12/2016 07:58

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1627930**
 Client Project ID: **CARTRIDGE EVALUATION**
 Purchase Order: **55502 Ref9**
 Project Manager: **Rand Potter**

General Lab Comments:

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scope s) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DxO ELAP)	ACE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DAJA1	http://health.utah.gov/labinfo/
	Nevada	UT00009	http://dep.nv.gov/soe/devlab/service.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/PCDnew/
	Iowa	IAH 376	http://www.iowadnr.gov/invest/CRS/Regulatory/Water.aspx
	Texas (TNI)	T 154764456-11-1	http://www.tceq.texas.gov/field/soelab_accred_cert.html
	Washington	C595-16	http://www.ecy.wa.gov/programs/soe/plabs/index.html
	Kansas	E-10416	http://www.kdheks.gov/lp/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101524	http://www.aihaaccreditedata.org
	Washington	C595-16	http://www.ecy.wa.gov/programs/soe/plabs/index.html
Lead Testing CPSC	ANAB (ISO 17025, CPSC)	ACE-1420	http://www.anab.org/accredited-organizations/
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101524	http://www.aihaaccreditedata.org
Dietary Supplements	ACCLASS (ISO 17025)	ACE-1420	http://www.acclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
 ND = Not Detected, Testing result not detected above the LOD or LOQ.
 NA = Not Applicable.
 ** No result could be reported, see sample comments for details.
 < This testing result is less than the numerical value.
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627930

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7832 (HBN: 178101)
Analyzed By: Fred Rejali

Blank

MB: 521250
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521744
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521747
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521750
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521753
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521756
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521251					LCS-D: 521252				
Analyzed: 10/11/2016 00:00					Analyzed: 10/11/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0334	0.0342	97.7	78.0 - 117.6	0.0331	96.8	0.903	0.0	20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627938	Preparation: NA Batch: NA Prepared By: NA	Analyte: NIOSH 1024 Batch: IFID7532 (rDN: 178101) Analyzed By: Fred Rajal
Limits: Historical/Performance Basic: ALS Laboratory Group		

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCB: 521745 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521746 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0365	0.0342	107	78.0 117.6	0.0365	107	0.00	0.0 20.0	
LCB: 521748 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521749 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0350	0.0342	102	78.0 117.6	0.0342	100	2.31	0.0 20.0	
LCB: 521751 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521752 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0330	0.0342	96.5	78.0 117.6	0.0350	102	5.69	0.0 20.0	
LCB: 521754 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521755 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0308	0.0308	100	78.0 117.6	0.0323	105	4.82	0.0 20.0	
LCB: 521757 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCBD: 521758 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0304	0.0308	98.8	78.0 117.6	0.0312	101	2.53	0.0 20.0	

QC Report Authorization (eS/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
eS/ Fred Rajal 10/11/2016 22:21	eS/ Thomas J. Masolan 10/13/2016 07:58

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

Assembler S/N		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. No. 301-63464	
Collector JAMES SAMP No.	Container JAMES	Phone No. 513-4343	Phone No. 513-4343	Page 2 of 4	
Project Title CARTON	Sample Code CARTON	Exchange Code 20250000	Exchange Code 20250000		
Shipped To (Lab)	Method of Disposal	See Order No. WTS-047	See Order No. WTS-047		
Previous S/N	Date Returned 11/18/02	Lab # 7723	Lab # 8817		
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis
01-001-0148	01-001-0148	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-A, 7	02149 -40
01-001-0149	01-001-0149	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-B, 7	02149 -40
01-001-0150	01-001-0150	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-A, 7	02149 -40
01-001-0151	01-001-0151	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-B, 7	02149 -40
01-001-0152	01-001-0152	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-A, 7	02149 -40
01-001-0153	01-001-0153	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-B, 7	02149 -40
01-001-0154	01-001-0154	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-A, 7	02149 -40
01-001-0155	01-001-0155	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-B, 7	02149 -40
01-001-0156	01-001-0156	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-A, 7	02149 -40
01-001-0157	01-001-0157	10/19/02	14	1, 2-Bottles/Box 18-02149-1-EP-0-102-B, 7	02149 -40
POSSIBLE SAMPLE TAGS/CONTAINERS (List all known items) <input type="radio"/> None <input checked="" type="radio"/> Yes <input type="radio"/> No					
<p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p>					
<p>Special Instructions: <i>Send samples to Carl & David 27, Carl & David 1, per, and Greg Singler, Gregory A. Singler, per see for tag 1011</i></p> <p>Reference Contact: <i>60432</i></p> <p>Phone: <i>313-4343</i></p> <p>Address: <i>1011 02149 BRICK 14 0</i></p>					
<p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p>		<p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p>		<p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p> <p>Requested by: <i>James J. James</i> Date: <i>10/19/02</i> Collected by: <i>James J. James</i> Date: <i>10/19/02</i></p>	
<p>Final Sample Description</p>		<p>Disposal Method (I.E. Return to collector, for lab processing, etc if present)</p>		<p>Date/Time</p>	
				<p>10/11/02</p>	
				<p>2100</p>	

FORM NO. 20183064
Page 3 of 4

CHAIN OF CUSTODY SAMPLE ANALYSIS REQUEST

Account #					
Collector Agency	Comstock/Proctor				
Sample No.	373-4841				
Project Title	2008080808 Change Code				
Shipped To (Lab)	Lab Order No. 419047				
Prepared By	Date Received 4/14/02				

Sample No.	Lab ID	Date	Time	Rel. Type	Container	Sample Analysis	Preservative
518953476	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953475	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953476	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953477	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953478	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953479	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953480	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953481	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953482	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C
518953483	76	10/19/76		50000001	10-00766-0-00-0-000-0		00113 -0C

POSSIBLE SAMPLE HAZARDOUSNESS (if all boxes marked) YES NO

SPECIAL INSTRUCTIONS: None (Priority 10, Cert. # 10101, P, Cert. # 10101, P, and Temp. # 10101, P, per the lab for email)

Requested by: Diana Turner, Bureau of Environmental Protection, 101 Allegheny Ave., Pittsburgh, PA 15222

Received by: Julie Gachon, 10/19/02

Requested by: Julie Gachon, 10/19/02

Received by: [Signature]

Requested by: [Signature]

Special Method (e.g., return to customer, per lab procedure) and in process

10/11/16 2:00

10/11/16 2:00

10/11/16 2:00



ANALYTICAL REPORT

Report Date: October 12, 2016

Robert (Buddy) Sosa
Washington River Protection So
PO Box 850, MSN T8-02
Richland, WA 99052

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov
20163060

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035314 Lab ID: 1627928001	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/06/2016		
Method: NIOSH 1613 Mod.	Media: SKC 228-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035315 Lab ID: 1627928002	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/06/2016		
Method: NIOSH 1613 Mod.	Media: SKC 228-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035316 Lab ID: 1627928003	Sampling Location: CARTRIDGE EVALUATION	Collected: 10/01/2016 Received: 10/06/2016		
Method: NIOSH 1613 Mod.	Media: SKC 228-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

ADDRESS: 960 West Lacey Drive, Salt Lake City, Utah, 84120 USA | PHONE: +1 801 266 7700 | FAX: +1 801 266 9992
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environmental

www.alsglobal.com

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Wed, 10/12/16 9:12 AM



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035317	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928004				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035318	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928005				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035319	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928006				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035320	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928007				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reig
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035321	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928008				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035322	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928009				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035323	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928010				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035324	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/01/2016
Lab ID: 1627928011				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: 34-1627928
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Reil
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Sample ID: S16T035325, Lab ID: 1627928012, Method: NIOSH 1613 Mod., Media: SKC 228-01, Charcoal Tube 100/50mg, and analytes Pyridine and 2,4-Dimethylpyridine.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Sample ID: S16T035326, Lab ID: 1627928013, Method: NIOSH 1613 Mod., Media: SKC 228-01, Charcoal Tube 100/50mg, and analytes Pyridine and 2,4-Dimethylpyridine.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Sample ID: S16T035327, Lab ID: 1627928014, Method: NIOSH 1613 Mod., Media: SKC 226-01, Charcoal Tube 100/50mg, and analytes Pyridine and 2,4-Dimethylpyridine.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Sample ID: S16T035328, Lab ID: 1627928015, Method: NIOSH 1613 Mod., Media: SKC 226-01, Charcoal Tube 100/50mg, and analytes Pyridine and 2,4-Dimethylpyridine.



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035329		Collected: 10/01/2016		
Lab ID: 1627928016		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035330		Collected: 10/01/2016		
Lab ID: 1627928017		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035331		Collected: 10/01/2016		
Lab ID: 1627928018		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035332		Collected: 10/01/2016		
Lab ID: 1627928019		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035333		Collected: 10/01/2016		
Lab ID: 1627928020		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035334		Collected: 10/02/2016		
Lab ID: 1627928021		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035335		Collected: 10/02/2016		
Lab ID: 1627928022		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035336		Collected: 10/02/2016		
Lab ID: 1627928023		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reig
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035337	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627928024				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035338	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627928025				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035339	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627928026				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035340	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627928027				Received: 10/05/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 10/06/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Re9
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035341		Collected: 10/02/2016		
Lab ID: 1627928028		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035342		Collected: 10/02/2016		
Lab ID: 1627928029		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035343		Collected: 10/02/2016		
Lab ID: 1627928030		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035344		Collected: 10/02/2016		
Lab ID: 1627928031		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Reel
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035345		Collected: 10/02/2016		
Lab ID: 1627928032		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035346		Collected: 10/02/2016		
Lab ID: 1627928033		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035347		Collected: 10/02/2016		
Lab ID: 1627928034		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035348		Collected: 10/02/2016		
Lab ID: 1627928035		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: 34-1627928
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55902 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Pyridine and 2,4-Dimethylpyridine with results <0.50.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Pyridine and 2,4-Dimethylpyridine with results <0.50.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Pyridine and 2,4-Dimethylpyridine with results <0.50.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Pyridine and 2,4-Dimethylpyridine with results <0.50.



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55902 Repl
 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035353	Sampling Location: CARTRIDGE EVALUATION			Collected: 10/02/2016
Lab ID: 1627928040				Received: 10/06/2016
Method: NIOSH 1613 Mod.	Media: SKC 228-01, Charcoal Tube 100/50mg			Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Comments

Quality Control: NIOSH 1613 Mod. - (HBM: 177979)

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed.

Quality Control: NIOSH 1613 Mod. - (HBM: 177980)

The LCS was non-detect for the target analytes and the LCSD was spiked with double the target analytes. NCCAR #1203 was initiated to investigate the issue.

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed.

Report Authorization (IS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1613 Mod.	IS/ David Teynor 10/11/2016 08:55	IS/ Thomas J. Masoian 10/12/2016 08:06

Laboratory Contact Information

ALS Environmental
 960 W Levoe Drive
 Salt Lake City, Utah 84123

Phone: (801) 266-7700
 Email: alst.lab@ALSGlobal.com
 Web: www.alslc.com



ANALYTICAL REPORT

Workorder: **34-1627928**
 Client Project ID: CARTRIDGE EVALUATION
 Purchase Order: 55502 Re9
 Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD/ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/testing/
	Nevada	UT00009	http://ndep.nv.gov/ndep/lab/service.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 179	http://www.iowadnr.gov/inside/Civil/Regulatory/Water.aspx
	Texas (TNE)	T104704456-11-1	http://www.tceq.texas.gov/fieldqa/lab_accred_certif.html
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Kansas	E-104 95	http://www.kdheks.gov/pol/index.html	
Industrial Hygiene	AHA LAF LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedata.org
	Washington	C595-10	http://www.ecy.wa.gov/programs/wap/lab/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Soil, Dust, Paint, Air	AHA LAF LLC (ISO 17025 & ISLAP/ELLAP)	101574	http://www.ahaaccreditedata.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclascorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
 ND = Not Detected, Testing result not detected above the LOD or LOQ.
 NA = Not Applicable.
 "" No result could be reported, see sample comments for details.
 < This testing result is less than the numerical value.
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627928

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: 05V00176 (RBN: 177979)
Analyzed By: David Teynor

Blank

LMB: 521507
Analyzed: 10/06/2016 15:49

Units: ug/sample

Analyte	Result	MDL	RL
Pyridine	ND	NA	0.500
2,4-Dimethylpyridine	ND	NA	0.500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521508
Analyzed: 10/06/2016 16:07

Dilution: 1

Units: ug/sample

LCSD: 521509

Analyzed: 10/06/2016 16:25

Dilution: 1

Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Pyridine	1.81	2.00	90.3	61.8 141.1	1.50	74.8	7.19	0.0 22.1
2,4-Dimethylpyridine	1.82	2.00	91.2	51.7 130.6	1.41	70.3	14.4	0.0 22.2

Comments

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed.

QC Report Authorization (i/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
iS/ David Teynor 10/11/2016 08:35	iS/ Thomas J. Masojan 10/11/2016 15:23

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ⊖ - Result is above the calibration range

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627928

Limits: Historical/Performance
Basic: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: 07000171 (RBN: 177960)
Analyzed By: David Taylor

Blank

LMB: 521510
Analyzed: 10/06/2016 16:33

Units: ug/sample

Analyte	Result	MDL	RL
Pyridine	ND	NA	0.500
2,4-Dimethylpyridine	ND	NA	0.500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521511
Analyzed: 10/06/2016 16:53
Dilution: 1
Units: ug/sample

LCSD: 521512
Analyzed: 10/06/2016 17:13
Dilution: 1
Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Pyridine	0.00	2.00	0.00	61.8 141.1	3.05	76.4	200	0.0 22.1
2,4-Dimethylpyridine	0.00	2.00	0.00	51.7 130.6	2.43	60.7	200	0.0 22.2

Comments

The LCS was non-detected for the target analytes and the LCSD was spiked with double the target analytes. NCCAR #1200 was initiated to investigate the issue.

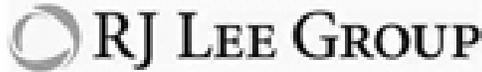
The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed.

QC Report Authorization (i/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyt	Peer Review
i/S/ David Taylor 10/11/2016 08:55	i/S/ Thomas J. Mancian 10/13/2016 08:06

Symbols and Definitions

- - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- ⊕ - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



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Carl Housald IV

11/22/16

Washington River Protection Solutions, LLC
 P.O. Box 850 MSIN 116-16
 Richland, WA 99352

Contract No.: 55503 RS

Project: Cartridge Evaluation

Subject: Nitrosamines Analysis Report, Group Number 20163073

Enclosed is the final report for group 20163073 number analyzed for Nitrosamines using NIOSH 2522-Modified. This group number 20163073 has been assigned a Columbia Basin Analytical Laboratories login-order number of W610006. This report consists of a summary report of the samples, a laboratory report of each nitrosamine, a single quality control report for the analysis batch, and a copy of the chain of custody.

General Set Comments

Columbia Basin Analytical Laboratories received 40 samples on 10/04/16 to be tested for Nitrosamines. The samples were analyzed in accordance with NIOSH 2522-Modified for N-Nitrosodimethylamine, N-Nitrosomethylethylamine, N-Nitrosodiethylamine, N-Nitrosodi-n-propylamine, N-Nitrosodi-n-butylamine, N-Nitrosopiperidine, N-Nitrosopyrrolidine, and N-Nitrosomorpholine. All results have been corrected for desorption efficiency and measurable levels in the blanks.

* Analyte not detected at or above MRL on initial analysis. Analyte detected at or above MRL on confirmation analysis. Analyte not confirmed.

X- Analyte detected at or above MRL on initial analysis. Analyte not detected at or above MRL on confirmation analysis. Analyte not confirmed.

C- Analyte detected at or above MRL on initial analysis and confirmation analysis. Poor mass agreement between initial and confirmation analysis indicates interference such that this result should be considered qualitative only.

Results

There were detectable nitrosamines concentrations at or above the reporting limit in the samples.

Sample Name	Lab ID	Analyzed	Analyte	Results	RL	Units	Flags
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco WA 99301 | 509.545.4999

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Report Template: WRPS_Nitrosamines 2.1.rpt

Approved: 11/22/16 11:31
 Report Time Stamp: 11/22/16 11:29



16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube

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16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosomorpholine	<0.022	0.022	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodiethylamine	0.041	0.023	ug/tube X
16-08765-12-IN-A	S16T035612	10/24/16	N-Nitrosodimethylamine	5.917	1.125	ug/tube D
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosomethylethylamine	0.154	0.023	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosomorpholine	0.052	0.023	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodiethylamine	0.056	0.023	ug/tube X
16-08765-12-IN-B	S16T035613	10/25/16	N-Nitrosodimethylamine	8.341	1.125	ug/tube D
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube *
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosomethylethylamine	0.249	0.023	ug/tube
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosomorpholine	0.195	0.023	ug/tube
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodiethylamine	0.049	0.023	ug/tube X
16-08765-12-IN-C	S16T035614	10/24/16	N-Nitrosodimethylamine	9.508	1.125	ug/tube D
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube *
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosomethylethylamine	0.225	0.023	ug/tube

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16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosomorpholine	0.214	0.023	ug/tube
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-IN-D	S16T035615	10/25/16	N-Nitrosodimethylamine	8.103	1.125	ug/tube D
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosomethylethylamine	0.199	0.023	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosomorpholine	0.193	0.023	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-IN-E	S16T035616	10/25/16	N-Nitrosodimethylamine	9.427	1.125	ug/tube D
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosomethylethylamine	0.245	0.023	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosomorpholine	0.192	0.023	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-IN-F	S16T035617	10/24/16	N-Nitrosodimethylamine	8.288	1.125	ug/tube D
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosomethylethylamine	0.247	0.023	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosomorpholine	0.211	0.022	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-IN-G	S16T035618	10/24/16	N-Nitrosodimethylamine	1.017	0.225	ug/tube D
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosomethylethylamine	0.030	0.023	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosomorpholine	0.047	0.022	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	ug/tube
16-08765-12-IN-H	S16T035619	10/24/16	N-Nitrosodimethylamine	7.652	1.125	ug/tube D,C
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosomethylethylamine	0.200	0.023	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosomorpholine	0.075	0.022	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosopiperidine	<0.024	0.024	ug/tube
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08765-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08765-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08765-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodimethylamine	0.030	0.017	ug/tube
16-08765-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube

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16-08766-12-BASE-IN	S16T035621	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-BASE-IN	S16T035621	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-BASE-IN	S16T035621	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-BASE-IN	S16T035621	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-BASE-IN	S16T035621	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-BLANK-EFF	S16T035622	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-BLANK-IN	S16T035623	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-A	S16T035624	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-B	S16T035625	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-C	S16T035626	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-D	S16T035627	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube

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16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-E	S16T035628	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-F	S16T035629	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-G	S16T035630	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosodimethylamine	<0.017	0.017	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosomethylethylamine	<0.024	0.024	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosomorpholine	<0.023	0.023	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-EFF-H	S16T035631	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosodiethylamine	0.066	0.024	ug/tube X
16-08766-12-14-A	S16T035632	10/25/16	N-Nitrosodimethylamine	5.750	1.064	ug/tube D,C
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosomethylethylamine	0.151	0.024	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosomorpholine	0.058	0.023	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-14-A	S16T035632	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosodiethylamine	<0.024	0.024	ug/tube
16-08766-12-14-B	S16T035633	10/25/16	N-Nitrosodimethylamine	7.436	1.064	ug/tube D,C
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosomethylethylamine	0.244	0.024	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosomorpholine	0.178	0.023	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube
16-08766-12-14-B	S16T035633	10/2 1/16	N-Nitrosopyrrolidine	<0.024	0.024	ug/tube
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosodiethylamine	0.087	0.024	ug/tube X
16-08766-12-14-C	S16T035634	10/25/16	N-Nitrosodimethylamine	9.241	1.064	ug/tube D
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosodi-n-butylamine	<0.024	0.024	ug/tube
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosodi-n-propylamine	<0.023	0.023	ug/tube
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosomethylethylamine	0.259	0.024	ug/tube
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosomorpholine	0.203	0.023	ug/tube
16-08766-12-14-C	S16T035634	10/2 1/16	N-Nitrosopiperidine	<0.023	0.023	ug/tube

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16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-IN-D	S16T035635	10/25/16	N-Nitrosodimethylamine	7.547	1.064	µg/tube D,C
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosomethylethylamine	0.223	0.024	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosomorpholine	0.155	0.023	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-IN-E	S16T035636	10/25/16	N-Nitrosodimethylamine	5.822	1.064	µg/tube D
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosomethylethylamine	0.174	0.024	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosomorpholine	0.055	0.023	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-IN-F	S16T035638	10/25/16	N-Nitrosodimethylamine	5.993	1.064	µg/tube D,C
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosomethylethylamine	0.180	0.024	µg/tube
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosomorpholine	0.030	0.023	µg/tube C
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-IN-G	S16T035640	10/25/16	N-Nitrosodimethylamine	5.786	1.064	µg/tube D, C
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosomethylethylamine	0.190	0.024	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosomorpholine	0.026	0.023	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-IN-H	S16T035641	10/25/16	N-Nitrosodimethylamine	4.451	1.064	µg/tube D,C
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosomethylethylamine	0.185	0.024	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube



Recovery Failures in the ICV, CCVs, LCSs, RL and MRL

There were no recovery failures in the CCVs, ICV, LCSs, MRL.

RSD Failures in the LCSs

There were no RSD failures between the laboratory control samples.

Measurable Blank Values

There were no measurable analytes in the blank samples.

Calibration Curves

The calibration curves for the Nitrosamines had an R-value that was 0.997 or better, over a range of 5.0 ng/mL to 200 ng/mL.

General Lab Comments

The results provided in this report relate only to the items tested. Samples were received in acceptable conditions unless otherwise noted in the comments above. Samples have not been field blank corrected unless otherwise noted in the general set comments above. This test report shall not be reproduced, except in full, without written approval of Columbia Basin Analytical Laboratories.

I certify that this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the Laboratory Director or a designee as verified by the following signature.

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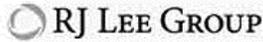
Scientist II DeNomy Dage

If you have any questions, please feel free to contact DeNomy Dage at ddage@rljg.com or at 509-545-4988.

This report has been reviewed and approved by the following individual:

 11/22/16

Scientist I Fernanda Pincheira



Carl Howald IV
 Washington River Protection
 Solutions, LLC
 P.O. Box 850 MSIN H6-16
 Richland, WA 99352
 Client Project:
 Cartridge Evaluation

Laboratory Report
 NIOSH 2522
 Air/Emissions on GC/TEA Analyzer
 Summary Table

RJ Lee Group No.: W610006
 Samples Received: 10/04/16
 Report Date: 11/22/16
 COC No.: 20163073
 Extraction Date: 10/12/16

Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08765-12-BASE-EFF S16T035597	W610006-01	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-BASE-IN S16T035600	W610006-02	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	

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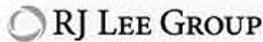
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16-08765-12-BLANK1 S16T035601	W610006-03	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-BLANK2 S16T035602	W610006-04	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-A S16T035603	W610006-05	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023			

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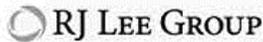
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/lube	RL	Qualifiers
16-08765-12-EFF-B S16T035605	W610006-06	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-C S16T035606	W610006-07	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-D S16T035607	W610006-08	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	

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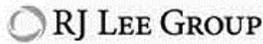
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16-08765-12-EFF-E S16T035608	W610006-09	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-F S16T035609	W610006-10	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-G S16T035610	W610006-11	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	

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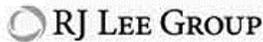
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16-08765-12-EFF-H S16T035611	W610006-12	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-IN-A S16T035612	W610006-13	10/01/16	10/20/16	N-Nitrosodiethylamine	0.041	0.023	X
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.164	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	5.754	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.184	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.052	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08765-12-IN-B S16T035613	W610006-14	10/01/16	10/20/16	N-Nitrosodiethylamine	0.056	0.023	X
		10/01/16	10/24/16	N-Nitrosodimethylamine	8.141	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.200	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	*
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.249	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.195	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			
16-08765-12-IN-C S16T035614	W610006-15	10/01/16	10/20/16	N-Nitrosodiethylamine	0.049	0.023	X
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.754	0.230	D
		10/01/16	10/24/16	N-Nitrosodimethylamine	8.753	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	*
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.225	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.214	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			

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16-08765-12-IN-D S16T035615	W610006-16	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	7.252	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.035	0.025	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.816	0.230	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.199	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.193	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			
16-08765-12-IN-E S16T035616	W610006-17	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	9.081	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.346	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.245	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.192	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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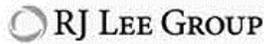
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16-08765-12-IN-F S16T035617	W610006-18	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.306	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	7.982	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.247	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.211	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			
16-08765-12-IN-G S16T035618	W610006-19	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.036	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	0.982	0.225	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.030	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.047	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023			

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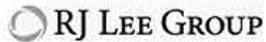
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16-08765-12-IN-H S16T035619	W610006-20	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.152	0.023	C
		10/01/16	10/24/16	N-Nitrosodimethylamine	7.499	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.200	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.075	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08766-12-BASE-EFF S16T035620	W610006-21	10/02/16	10/20/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/20/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosopyrrolidine	<0.024	0.024	

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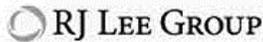
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16-08766-12-BASE-IN S16T035621	W610006-22	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	0.030	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-BLANK-EFF S16T035622	W610006-23	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-BLANK-IN S16T035623	W610006-24	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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16-08766-12-EFF-A S16T035624	W610006-25	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-B S16T035625	W610006-26	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-C S16T035626	W610006-27	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	

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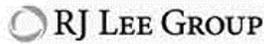
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-EFF-D S16T035627	W610006-28	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-E S16T035628	W610006-29	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-F S16T035629	W610006-30	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	

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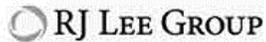
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-EFF-G S16T035630	W610006-31	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-EFF-H S16T035631	W610006-32	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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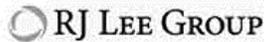
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-IN-A S16T035632	W610006-33	10/02/16	10/21/16	N-Nitrosodiethylamine	0.066	0.024	X
		10/02/16	10/25/16	N-Nitrosodimethylamine	5.704	1.06	D
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.046	0.023	C
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.151	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.058	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-B S16T035633	W610006-34	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.129	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	7.307	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.244	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.178	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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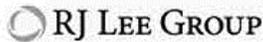
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-IN-C S16T035634	W610006-35	10/02/16	10/21/16	N-Nitrosodiethylamine	0.067	0.024	X
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.225	0.023	
		10/02/16	10/25/16	N-Nitrosodimethylamine	9.016	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.259	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.203	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-D S16T035635	W610006-36	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.348	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	7.199	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.223	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.155	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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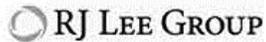
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-IN-E S16T035636	W610006-37	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.190	0.023	
		10/02/16	10/25/16	N-Nitrosodimethylamine	5.632	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.174	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.055	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-F S16T035638	W610006-38	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.304	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.026	0.025	
		10/02/16	10/25/16	N-Nitrosodimethylamine	5.663	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.180	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.030	0.023	C
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024			

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-IN-G S16T035640	W610006-39	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	6.599	1.06	D, C
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.187	0.023	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.190	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.026	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-H S16T035641	W610006-40	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.154	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	4.297	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.185	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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Report Qualifiers

A = Target Analyte meets health/risk report, an analysis of report

D = Analyte analyzed in a dilution

E = Report concentration over above the instrument calibration range

F = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, not 100% or IR match

R = RPD (relative percent difference) outside accepted recovery limits

S = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated block

d = Data that exceeds the MSD criteria set by the SOP

W = Holding time for preparation or analysis exceeded

L = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

S = Spike Recovery outside accepted recovery limits

Z = Not CLAP accredited analyzer

SD = Not Detected

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 Richland, WA 99352

Quality Control
 NI05H12522

RJ Lee Group No.: W610006
 Samples Received: 10/04/16
 Report Date: 11/22/16
 COC No.: 20162073
 Extraction Date: 10/24/16

Client Project:
 Cartridge Evaluation

Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	BLK	10/24/16		0.00	0.98	0.00			
N-Nitrosodimethylamine	62-75-9	BLK	10/24/16		0.00	0.89	0.00			
N-Nitrosod-n-butylamine	924-16-3	BLK	10/24/16		0.00	0.99	0.00			
N-Nitrosod-n-propylamine	621-64-7	BLK	10/24/16		0.00	0.93	0.00			
N-Nitrosomethylethylamine	10595-95-6	BLK	10/24/16		0.00	0.94	0.00			
N-Nitrosomorpholine	59-89-2	BLK	10/24/16		0.00	0.97	0.00			
N-Nitrosopiperidine	100-75-4	BLK	10/24/16		0.00	0.97	0.00			
N-Nitrosopyrrolidine	930-55-2	BLK	10/24/16		0.00	0.93	0.00			
N-Nitrosodiethylamine	55-18-5	BLK1	10/24/16		0.00	0.99	0.00			
N-Nitrosodimethylamine	62-75-9	BLK1	10/24/16		0.00	0.94	0.00			
N-Nitrosod-n-butylamine	924-16-3	BLK1	10/24/16		0.00	1.03	0.00			
N-Nitrosod-n-propylamine	621-64-7	BLK1	10/24/16		0.00	1.02	0.00			
N-Nitrosomethylethylamine	10595-95-6	BLK1	10/24/16		0.00	0.98	0.00			
N-Nitrosomorpholine	59-89-2	BLK1	10/24/16		0.00	1.02	0.00			
N-Nitrosopiperidine	100-75-4	BLK1	10/24/16		0.00	1.00	0.00			
N-Nitrosopyrrolidine	930-55-2	BLK1	10/24/16		0.00	0.99	0.00			
N-Nitrosodiethylamine	55-18-5	LCS-1	10/19/16	0.200	0.173	0.85	0.203	101	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/20/16	0.200	0.175	0.84	0.207	103	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/25/16	0.200	0.178	0.91	0.198	97.8	2.62	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/25/16	0.200	0.174	0.84	0.207	104	5.11	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/19/16	0.200	0.184	0.79	0.206	103	6.51	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/20/16	0.200	0.172	0.84	0.204	102	2.29	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/25/16	0.200	0.173	0.87	0.199	99.8	1.54	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/25/16	0.200	0.170	0.81	0.210	105	4.86	
N-Nitrosod-n-butylamine	924-16-3	LCS-1	10/19/16	0.200	0.173	0.85	0.202	101	1.50	
N-Nitrosod-n-butylamine	924-16-3	LCS-1	10/20/16	0.200	0.170	0.85	0.201	100	1.13	
N-Nitrosod-n-butylamine	924-16-3	LCS-1	10/25/16	0.200	0.175	0.92	0.190	95.3	4.06	
N-Nitrosod-n-butylamine	924-16-3	LCS-1	10/25/16	0.200	0.180	0.88	0.204	102	3.26	
N-Nitrosod-n-propylamine	621-64-7	LCS-1	10/19/16	0.200	0.173	0.84	0.206	103	4.33	
N-Nitrosod-n-propylamine	621-64-7	LCS-1	10/20/16	0.200	0.176	0.86	0.204	102	2.12	
N-Nitrosod-n-propylamine	621-64-7	LCS-1	10/25/16	0.200	0.180	0.92	0.195	97.6	2.15	
N-Nitrosod-n-propylamine	621-64-7	LCS-1	10/25/16	0.200	0.178	0.87	0.204	102	1.89	

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomethylethylamine	10595-95-8	LCS-1	10/19/16	0.200	0.179	0.88	0.207	104	5.40	
N-Nitrosomethylethylamine	10595-95-8	LCS-1	10/20/16	0.200	0.173	0.85	0.204	102	2.14	
N-Nitrosomethylethylamine	10595-95-8	LCS-1	10/25/16	0.200	0.177	0.90	0.197	97.9	2.22	
N-Nitrosomethylethylamine	10595-95-8	LCS-1	10/25/16	0.200	0.173	0.83	0.209	104	4.97	
N-Nitrosomorpholine	59-89-2	LCS-1	10/19/16	0.200	0.190	0.92	0.207	103	4.29	
N-Nitrosomorpholine	59-89-2	LCS-1	10/20/16	0.200	0.174	0.86	0.203	101	1.35	
N-Nitrosomorpholine	59-89-2	LCS-1	10/25/16	0.200	0.181	0.92	0.197	98.1	3.50	
N-Nitrosomorpholine	59-89-2	LCS-1	10/25/16	0.200	0.179	0.87	0.207	103	3.52	
N-Nitrosopiperidine	100-75-4	LCS-1	10/19/16	0.200	0.172	0.84	0.206	103	4.54	
N-Nitrosopiperidine	100-75-4	LCS-1	10/20/16	0.200	0.174	0.86	0.203	102	2.11	
N-Nitrosopiperidine	100-75-4	LCS-1	10/25/16	0.200	0.179	0.91	0.197	98.1	1.71	
N-Nitrosopiperidine	100-75-4	LCS-1	10/25/16	0.200	0.181	0.88	0.211	105	4.92	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/19/16	0.200	0.179	0.87	0.206	103	4.82	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/20/16	0.200	0.173	0.85	0.204	102	2.21	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/25/16	0.200	0.177	0.90	0.197	98.5	2.74	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/25/16	0.200	0.179	0.85	0.210	105	4.83	
N-Nitrosodietylamine	55-18-5	LCS-2	10/19/16	0.200	0.184	0.85	0.193	96.3	3.21	
N-Nitrosodietylamine	55-18-5	LCS-2	10/20/16	0.200	0.169	0.84	0.200	99.8	3.21	
N-Nitrosodietylamine	55-18-5	LCS-2	10/25/16	0.200	0.180	0.91	0.199	99.3	2.62	
N-Nitrosodietylamine	55-18-5	LCS-2	10/25/16	0.200	0.158	0.84	0.188	94.2	5.11	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/19/16	0.200	0.147	0.79	0.188	92.5	6.51	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/20/16	0.200	0.170	0.84	0.201	101	2.29	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/25/16	0.200	0.172	0.87	0.198	98.7	1.54	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/25/16	0.200	0.154	0.81	0.190	95.2	4.86	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/19/16	0.200	0.168	0.85	0.197	98.4	1.50	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/20/16	0.200	0.171	0.85	0.202	101	1.13	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/25/16	0.200	0.189	0.92	0.208	102	4.08	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/25/16	0.200	0.170	0.88	0.193	96.2	3.26	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/19/16	0.200	0.190	0.84	0.191	95.0	4.33	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/20/16	0.200	0.174	0.86	0.202	100	2.12	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/25/16	0.200	0.186	0.92	0.202	101	2.15	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/25/16	0.200	0.172	0.87	0.195	96.9	1.89	
N-Nitrosomethylethylamine	10595-95-8	LCS-2	10/19/16	0.200	0.162	0.80	0.188	93.8	5.40	
N-Nitrosomethylethylamine	10595-95-8	LCS-2	10/20/16	0.200	0.170	0.85	0.201	99.9	2.14	
N-Nitrosomethylethylamine	10595-95-8	LCS-2	10/25/16	0.200	0.180	0.90	0.200	99.7	2.22	
N-Nitrosomethylethylamine	10595-95-8	LCS-2	10/25/16	0.200	0.157	0.83	0.189	94.7	4.97	
N-Nitrosomorpholine	59-89-2	LCS-2	10/19/16	0.200	0.175	0.92	0.190	95.1	4.29	
N-Nitrosomorpholine	59-89-2	LCS-2	10/20/16	0.200	0.171	0.86	0.200	99.9	1.35	
N-Nitrosomorpholine	59-89-2	LCS-2	10/25/16	0.200	0.180	0.92	0.195	97.9	3.50	

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	LC8-2	10/25/16	0.200	0.187	0.87	0.193	96.4	3.52	
N-Nitrosopiperidine	100-75-4	LC8-2	10/19/16	0.200	0.158	0.84	0.190	94.8	4.54	
N-Nitrosopiperidine	100-75-4	LC8-2	10/20/16	0.200	0.172	0.86	0.201	101	2.11	
N-Nitrosopiperidine	100-75-4	LC8-2	10/25/16	0.200	0.183	0.91	0.201	100	1.71	
N-Nitrosopiperidine	100-75-4	LC8-2	10/25/16	0.200	0.165	0.85	0.192	95.9	4.92	
N-Nitrosopyrrolidine	930-55-2	LC8-2	10/19/16	0.200	0.164	0.87	0.189	94.5	4.82	
N-Nitrosopyrrolidine	930-55-2	LC8-2	10/20/16	0.200	0.171	0.85	0.202	101	2.21	
N-Nitrosopyrrolidine	930-55-2	LC8-2	10/25/16	0.200	0.177	0.90	0.197	98.3	2.74	
N-Nitrosopyrrolidine	930-55-2	LC8-2	10/25/16	0.200	0.162	0.85	0.190	95.0	4.83	
N-Nitrosodietylamine	55-18-5	LC8-3	10/19/16	0.200	0.175	0.85	0.205	102	3.21	
N-Nitrosodietylamine	55-18-5	LC8-3	10/20/16	0.200	0.164	0.84	0.194	96.9	3.21	
N-Nitrosodietylamine	55-18-5	LC8-3	10/25/16	0.200	0.187	0.91	0.206	103	2.62	
N-Nitrosodietylamine	55-18-5	LC8-3	10/25/16	0.200	0.172	0.84	0.205	102	5.11	
N-Nitrosodimethylamine	62-75-9	LC8-3	10/19/16	0.200	0.166	0.79	0.209	104	6.51	
N-Nitrosodimethylamine	62-75-9	LC8-3	10/20/16	0.200	0.165	0.84	0.195	97.4	2.29	
N-Nitrosodimethylamine	62-75-9	LC8-3	10/25/16	0.200	0.177	0.87	0.204	102	1.54	
N-Nitrosodimethylamine	62-75-9	LC8-3	10/25/16	0.200	0.162	0.81	0.200	99.8	4.86	
N-Nitrosod-n-butylamine	924-16-3	LC8-3	10/19/16	0.200	0.172	0.85	0.201	100	1.50	
N-Nitrosod-n-butylamine	924-16-3	LC8-3	10/20/16	0.200	0.167	0.85	0.197	98.7	1.13	
N-Nitrosod-n-butylamine	924-16-3	LC8-3	10/25/16	0.200	0.188	0.92	0.205	102	4.06	
N-Nitrosod-n-butylamine	924-16-3	LC8-3	10/25/16	0.200	0.180	0.88	0.204	102	3.26	
N-Nitrosod-n-propylamine	621-64-7	LC8-3	10/19/16	0.200	0.171	0.84	0.204	102	4.33	
N-Nitrosod-n-propylamine	621-64-7	LC8-3	10/20/16	0.200	0.169	0.86	0.195	97.7	2.12	
N-Nitrosod-n-propylamine	621-64-7	LC8-3	10/25/16	0.200	0.188	0.92	0.204	102	2.15	
N-Nitrosod-n-propylamine	621-64-7	LC8-3	10/25/16	0.200	0.173	0.87	0.199	96.9	1.89	
N-Nitrosomethylethylamine	10595-95-6	LC8-3	10/19/16	0.200	0.177	0.86	0.205	103	5.40	
N-Nitrosomethylethylamine	10595-95-6	LC8-3	10/20/16	0.200	0.166	0.85	0.196	97.9	2.14	
N-Nitrosomethylethylamine	10595-95-6	LC8-3	10/25/16	0.200	0.185	0.90	0.205	102	2.22	
N-Nitrosomethylethylamine	10595-95-6	LC8-3	10/25/16	0.200	0.167	0.83	0.202	101	4.97	
N-Nitrosomorpholine	59-89-2	LC8-3	10/19/16	0.200	0.187	0.92	0.203	102	4.29	
N-Nitrosomorpholine	59-89-2	LC8-3	10/20/16	0.200	0.169	0.86	0.197	98.7	1.35	
N-Nitrosomorpholine	59-89-2	LC8-3	10/25/16	0.200	0.192	0.92	0.209	104	3.50	
N-Nitrosomorpholine	59-89-2	LC8-3	10/25/16	0.200	0.174	0.87	0.201	100	3.52	
N-Nitrosopiperidine	100-75-4	LC8-3	10/19/16	0.200	0.172	0.84	0.205	103	4.54	
N-Nitrosopiperidine	100-75-4	LC8-3	10/20/16	0.200	0.167	0.86	0.195	97.8	2.11	
N-Nitrosopiperidine	100-75-4	LC8-3	10/25/16	0.200	0.185	0.91	0.203	101	1.71	
N-Nitrosopiperidine	100-75-4	LC8-3	10/25/16	0.200	0.170	0.86	0.198	98.7	4.92	
N-Nitrosopyrrolidine	930-55-2	LC8-3	10/19/16	0.200	0.178	0.87	0.205	102	4.82	
N-Nitrosopyrrolidine	930-55-2	LC8-3	10/20/16	0.200	0.165	0.85	0.195	97.5	2.21	

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/25/16	0.200	0.188	0.90	0.207	103	2.74	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/25/16	0.200	0.171	0.85	0.200	100	4.83	
N-Nitrosodiethylamine	55-18-5	LSC-1	10/24/16	0.200	0.195	0.98	0.204	102	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-1	10/24/16	0.200	0.202	0.99	0.204	101	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-1	10/24/16	0.200	0.186	0.89	0.209	104	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-1	10/24/16	0.200	0.190	0.94	0.202	101	2.06	
N-Nitrosod-n-butylamine	924-16-3	LSC-1	10/24/16	0.200	0.200	0.99	0.201	100	4.00	
N-Nitrosod-n-butylamine	924-16-3	LSC-1	10/24/16	0.200	0.211	1.03	0.204	102	1.79	
N-Nitrosod-n-propylamine	621-64-7	LSC-1	10/24/16	0.200	0.197	0.98	0.200	100	3.25	
N-Nitrosod-n-propylamine	621-64-7	LSC-1	10/24/16	0.200	0.204	1.02	0.201	100	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-1	10/24/16	0.200	0.193	0.94	0.205	102	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-1	10/24/16	0.200	0.198	0.98	0.202	101	0.694	
N-Nitrosomorpholine	59-89-2	LSC-1	10/24/16	0.200	0.197	0.97	0.203	101	4.33	
N-Nitrosomorpholine	59-89-2	LSC-1	10/24/16	0.200	0.206	1.02	0.201	101	0.921	
N-Nitrosopiperidine	100-75-4	LSC-1	10/24/16	0.200	0.199	0.97	0.206	103	4.83	
N-Nitrosopiperidine	100-75-4	LSC-1	10/24/16	0.200	0.202	1.00	0.202	101	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-1	10/24/16	0.200	0.188	0.93	0.202	101	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-1	10/24/16	0.200	0.198	0.99	0.200	100	0.498	
N-Nitrosodiethylamine	55-18-5	LSC-2	10/24/16	0.200	0.182	0.91	0.190	95.2	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-2	10/24/16	0.200	0.198	0.99	0.200	99.5	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-2	10/24/16	0.200	0.184	0.89	0.184	92.3	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-2	10/24/16	0.200	0.191	0.94	0.203	101	2.06	
N-Nitrosod-n-butylamine	924-16-3	LSC-2	10/24/16	0.200	0.191	0.99	0.192	95.8	4.00	
N-Nitrosod-n-butylamine	924-16-3	LSC-2	10/24/16	0.200	0.204	1.03	0.197	98.2	1.79	
N-Nitrosod-n-propylamine	621-64-7	LSC-2	10/24/16	0.200	0.190	0.98	0.193	95.6	3.25	
N-Nitrosod-n-propylamine	621-64-7	LSC-2	10/24/16	0.200	0.203	1.02	0.200	99.9	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-2	10/24/16	0.200	0.180	0.94	0.191	95.0	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-2	10/24/16	0.200	0.195	0.98	0.199	99.3	0.694	
N-Nitrosomorpholine	59-89-2	LSC-2	10/24/16	0.200	0.185	0.97	0.191	95.1	4.33	
N-Nitrosomorpholine	59-89-2	LSC-2	10/24/16	0.200	0.206	1.02	0.201	101	0.921	
N-Nitrosopiperidine	100-75-4	LSC-2	10/24/16	0.200	0.183	0.97	0.190	94.4	4.83	
N-Nitrosopiperidine	100-75-4	LSC-2	10/24/16	0.200	0.202	1.00	0.202	101	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-2	10/24/16	0.200	0.174	0.93	0.187	93.2	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-2	10/24/16	0.200	0.197	0.99	0.199	99.5	0.498	
N-Nitrosodiethylamine	55-18-5	LSC-3	10/24/16	0.200	0.197	0.98	0.208	103	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-3	10/24/16	0.200	0.197	0.99	0.199	99.0	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-3	10/24/16	0.200	0.184	0.89	0.207	103	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-3	10/24/16	0.200	0.184	0.94	0.196	97.6	2.06	
N-Nitrosod-n-butylamine	924-16-3	LSC-3	10/24/16	0.200	0.207	0.99	0.208	104	4.00	

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosod-n-butylamine	924-16-3	LSC-3	10/24/16	0.200	0.207	1.03	0.200	99.9	1.79	
N-Nitrosod-n-propylamine	621-64-7	LSC-3	10/24/16	0.200	0.203	0.98	0.206	103	3.25	
N-Nitrosod-n-propylamine	621-64-7	LSC-3	10/24/16	0.200	0.203	1.02	0.200	99.9	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-3	10/24/16	0.200	0.194	0.94	0.206	103	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-3	10/24/16	0.200	0.196	0.98	0.200	99.9	0.694	
N-Nitrosomorpholine	59-89-2	LSC-3	10/24/16	0.200	0.201	0.97	0.207	103	4.33	
N-Nitrosomorpholine	59-89-2	LSC-3	10/24/16	0.200	0.203	1.02	0.198	98.9	0.921	
N-Nitrosopiperidine	100-75-4	LSC-3	10/24/16	0.200	0.199	0.97	0.206	103	4.83	
N-Nitrosopiperidine	100-75-4	LSC-3	10/24/16	0.200	0.198	1.00	0.198	98.5	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-3	10/24/16	0.200	0.198	0.93	0.212	106	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-3	10/24/16	0.200	0.199	0.99	0.201	100	0.498	
N-Nitrosodiethylamine	55-18-5	MB	10/19/16		0.00	0.85	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/20/16		0.00	0.84	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/25/16		0.00	0.91	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/25/16		0.00	0.84	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/19/16		0.00	0.79	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/20/16		0.00	0.84	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/25/16		0.00	0.81	0.00			
N-Nitrosod-n-butylamine	924-16-3	MB	10/19/16		0.00	0.85	0.00			
N-Nitrosod-n-butylamine	924-16-3	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosod-n-butylamine	924-16-3	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosod-n-butylamine	924-16-3	MB	10/25/16		0.00	0.88	0.00			
N-Nitrosod-n-propylamine	621-64-7	MB	10/19/16		0.00	0.84	0.00			
N-Nitrosod-n-propylamine	621-64-7	MB	10/20/16		0.00	0.86	0.00			
N-Nitrosod-n-propylamine	621-64-7	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosod-n-propylamine	621-64-7	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/19/16		0.00	0.86	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/25/16		0.00	0.90	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/25/16		0.00	0.83	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/19/16		0.00	0.92	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/19/16		0.00	0.84	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/20/16		0.00	0.86	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/25/16		0.00	0.91	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/25/16		0.00	0.86	0.00			

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MB	10/19/16		0.00	0.87	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/25/16		0.00	0.90	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/25/16		0.00	0.85	0.00			
N-Nitrosodiethylamine	55-18-5	MRL	10/19/16	0.020	0.020	0.85	0.024	122		
N-Nitrosodiethylamine	55-18-5	MRL	10/20/16	0.020	0.018	0.84	0.021	106		
N-Nitrosodiethylamine	55-18-5	MRL	10/24/16	0.020	0.020	0.96	0.021	106		
N-Nitrosodiethylamine	55-18-5	MRL	10/25/16	0.020	0.020	0.91	0.022	111		
N-Nitrosodiethylamine	55-18-5	MRL	10/25/16	0.020	0.018	0.84	0.021	106		
N-Nitrosodimethylamine	62-75-9	MRL	10/19/16	0.020	0.022	0.79	0.028	138		
N-Nitrosodimethylamine	62-75-9	MRL	10/20/16	0.020	0.020	0.84	0.024	121		
N-Nitrosodimethylamine	62-75-9	MRL	10/24/16	0.020	0.019	0.89	0.021	107		
N-Nitrosodimethylamine	62-75-9	MRL	10/25/16	0.020	0.021	0.87	0.024	119		
N-Nitrosodimethylamine	62-75-9	MRL	10/25/16	0.020	0.019	0.81	0.024	122		
N-Nitrosod-n-butylamine	924-16-3	MRL	10/19/16	0.020	0.017	0.85	0.020	97.8		
N-Nitrosod-n-butylamine	924-16-3	MRL	10/20/16	0.020	0.019	0.85	0.022	109		
N-Nitrosod-n-butylamine	924-16-3	MRL	10/24/16	0.020	0.022	0.99	0.022	108		
N-Nitrosod-n-butylamine	924-16-3	MRL	10/25/16	0.020	0.016	0.92	0.017	87.0		
N-Nitrosod-n-butylamine	924-16-3	MRL	10/25/16	0.020	0.017	0.88	0.019	97.0		
N-Nitrosod-n-propylamine	621-64-7	MRL	10/19/16	0.020	0.018	0.84	0.022	108		
N-Nitrosod-n-propylamine	621-64-7	MRL	10/20/16	0.020	0.017	0.86	0.020	102		
N-Nitrosod-n-propylamine	621-64-7	MRL	10/24/16	0.020	0.017	0.96	0.017	86.2		
N-Nitrosod-n-propylamine	621-64-7	MRL	10/25/16	0.020	0.018	0.92	0.019	94.9		
N-Nitrosod-n-propylamine	621-64-7	MRL	10/25/16	0.020	0.019	0.87	0.022	110		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/19/16	0.020	0.021	0.86	0.024	118		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/20/16	0.020	0.017	0.85	0.020	101		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/24/16	0.020	0.019	0.94	0.020	96.2		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/25/16	0.020	0.018	0.90	0.020	99.5		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/25/16	0.020	0.017	0.83	0.020	100		
N-Nitrosomorpholine	59-89-2	MRL	10/19/16	0.020	0.023	0.92	0.025	127		
N-Nitrosomorpholine	59-89-2	MRL	10/20/16	0.020	0.018	0.86	0.021	105		
N-Nitrosomorpholine	59-89-2	MRL	10/24/16	0.020	0.018	0.97	0.019	93.1		
N-Nitrosomorpholine	59-89-2	MRL	10/25/16	0.020	0.020	0.92	0.022	108		
N-Nitrosomorpholine	59-89-2	MRL	10/25/16	0.020	0.019	0.87	0.022	112		
N-Nitrosopiperidine	100-75-4	MRL	10/19/16	0.020	0.021	0.84	0.025	124		
N-Nitrosopiperidine	100-75-4	MRL	10/20/16	0.020	0.019	0.86	0.022	108		
N-Nitrosopiperidine	100-75-4	MRL	10/24/16	0.020	0.017	0.97	0.018	90.1		
N-Nitrosopiperidine	100-75-4	MRL	10/25/16	0.020	0.017	0.91	0.019	92.7		
N-Nitrosopiperidine	100-75-4	MRL	10/25/16	0.020	0.019	0.86	0.022	108		

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Report Template: WRPS_Nitrosamines 2.1.rpt

Approved: 11/23/16 11:31
Report Time Stamp: 11/23/16 13:29



Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MRL	10/19/16	0.020	0.023	0.87	0.027	137		
N-Nitrosopyrrolidine	930-55-2	MRL	10/20/16	0.020	0.018	0.85	0.021	107		
N-Nitrosopyrrolidine	930-55-2	MRL	10/24/16	0.020	0.018	0.93	0.019	93.5		
N-Nitrosopyrrolidine	930-55-2	MRL	10/25/16	0.020	0.019	0.90	0.021	103		
N-Nitrosopyrrolidine	930-55-2	MRL	10/25/16	0.020	0.019	0.85	0.022	111		
N-Nitrosodimethylamine	55-18-5	MRL 1	10/24/16	0.020	0.021	0.99	0.021	106		
N-Nitrosodimethylamine	62-75-9	MRL 1	10/24/16	0.020	0.020	0.94	0.021	102		
N-Nitrosod-n-butylamine	924-16-3	MRL 1	10/24/16	0.020	0.018	1.03	0.017	85.7		
N-Nitrosod-n-propylamine	621-64-7	MRL 1	10/24/16	0.020	0.019	1.02	0.019	94.6		
N-Nitrosomethylethylamine	10595-95-6	MRL 1	10/24/16	0.020	0.019	0.98	0.019	95.1		
N-Nitrosomorpholine	59-89-2	MRL 1	10/24/16	0.020	0.018	1.02	0.018	89.1		
N-Nitrosopiperidine	100-75-4	MRL 1	10/24/16	0.020	0.017	1.00	0.017	84.7		
N-Nitrosopyrrolidine	930-55-2	MRL 1	10/24/16	0.020	0.019	0.99	0.019	93.6		

Report Qualifiers

- A = Target Analyte made (throughout report), an analytical report
- D = Analyte analyzed in a dilution
- E = Report concentration may show the instrument calibration range
- J = Analyte detected below quantitation limits, concentration is estimated
- P = Library spectrum match, not >95% or <37 match
- R = MSD Institute general reference method accepted recovery limits
- S = Analyte analyzed for but not detected
- NA = Not Applicable
- # = Analyte detected in the associated blank
- d = Data that exceeds the MQL criteria set by the SOP
- W = Holding time for preparation or analysis exceeded
- X = Sample condition at receipt not of compliance with method defined conditions
- Q = Small set of method specific acceptance QC criteria
- Z = After Recovery method accepted recovery limits
- Z = Not ILSAP accredited analyzer
- NDP = Not Detected

Scientist II DeNomy Dagg

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Methods outlined in writing to reference the samples covered by this report. RJ Lee Group will store the samples for a period of ninety (90) days (after discarding). Shipping and handling fee will be assessed for the return of any samples. Methods alternative method, samples were received in an acceptable condition. This laboratory operates in accordance with ISO 17025 guidelines, and holds limited scope of accreditation under CMAA LAP Lab-Cat 4941 JMSA LAP, LLC Lab-ID 17025 1714 87904610 and 19117025 Lab-ID-C204. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items listed on the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be

W610006

Assembled		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		CDDC No. 20161013	
s/v				Page 1 of 4	
Collector Name	Collector	Collection Date	Collection Time	Telephone No. 713-6661	Mail 713-65 FAX 713-1874
TDI# No.	Sample Origin	Collection Location	Original Vessel Package No.	Port/State/County Code	Temp. (C)
Project Title	Method of Segment	Method of Sample	Site of Collection (BRT No.)	Port and Return No.	
Shipped To (Lab)					
Protocol					
Sample No.	LAB ID	Date	Time	No./Type Container	Sample Analysis
	0187035597	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-BALD-STR J -
	0187035600	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-BALD-TR - -
	0187035601	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-BALD1 - -
	0187035602	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-BALD2 - -
	0187035603	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-A J -
	0187035604	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-B J -
	0187035605	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-C J -
	0187035606	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-D J -
	0187035607	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-E J -
	0187035608	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-F J -
	0187035609	VA 10/17/16		Thermosep-2	Microanalysis 16-01165-12-STR-G J -
<p>POSSIBLE SAMPLE HAZARDOUS/HAZAROUS (List all known agents) <input type="radio"/> YES <input checked="" type="radio"/> NO</p> <p>SPECIAL INSTRUCTIONS: Special Analysis to Carl Bouldin by 4 days. See below. Carl Bouldin per and weight. 2.5, standardized per see for the mail.</p> <p>CONTACT: 515443</p> <p>Field Time</p>					
Manufactured by	Received by	Quantity	Quantity	Material	Material
<p>Received by <i>Re Rogers</i> 10/14/16 10:50</p> <p>Received by <i>Re Rogers</i> 10/14/16 1:30</p>	<p>Received by <i>Re Rogers</i> 10/14/16 1:30</p> <p>Received by <i>Re Rogers</i> 10/14/16 1:30</p>	<p>Quantity</p> <p>Quantity</p>	<p>Quantity</p> <p>Quantity</p>	<p>Soil</p> <p>Soil</p> <p>Soil</p> <p>Sludge</p> <p>Water</p> <p>Other</p>	<p>Soil</p> <p>Soil</p> <p>Soil</p> <p>Sludge</p> <p>Water</p> <p>Other</p>
<p>Disposal Method (e.g., Return to customer, per lab procedure, used to process)</p> <p>CONTAINER</p>	<p>Disposed by <i>Dorcas Smith</i> 12-40</p>	<p>As samples containing hazardous materials shall be picked up by regulator and returned to general container or site of origin.</p> <p>A40003-002 (03/05)</p>			

WS10006
~~ANALYSES ARE VALID~~

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Account No. _____

COC No. 201403073

Page 3 of 4

Customer Name: _____

Order No.: _____

Sample Origin: _____

Original Vial Package No.: _____

Method of Transport: _____

Temp: 10.7

Telephone No.: 713-6463

Product Code/Change Code: _____

Lot/Order No.: _____

Lab of Laboratory Bill No.: _____

Items and Return No.: _____

Sample No.	Lab ID	Date	Time	Mat/Type Container	Retention	Sample Analysis	Preservative
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-28	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A
	818703443	10/7/14		Theanacarb-B	SEC0001000	14-08144-12-BA20-077	N/A

POSSIBLE SAMPLE MISIDENTIFICATION (BUT NOT KNOWN WITHIN) YES NO

SPECIAL INSTRUCTIONS: Hand samples to Carl should be a direct transfer. Care of samples for and sample 5, beneficial, per see for small

POST TIME: _____

Requested by: *Re Regues* Date/Time: _____ Received by: *Re Regues* Date/Time: _____

Requested by: *Re Regues* Date/Time: _____ Received by: *Re Regues* Date/Time: _____

Requested by: *Re Regues* Date/Time: _____ Received by: *Re Regues* Date/Time: _____

Requested by: _____ Date/Time: _____ Received by: _____ Date/Time: _____

Final Sample Description: **CONSUME** Date/Time: *11/09/14 12:40*

Signature: *Danette Smith*

All samples containing hazardous materials shall be picked up by injector and returned to parent container or site of origin.

44-000-982 (03/09)

Appendix D

Data Reduction Steps

Appendix D

Data Reduction Steps

1. Only chemicals in the current Chemicals of Potential Concern (COPC) list were included in the calculated data. Nitrous oxide and methanol were not measured in the study. Any other missing COPCs were analyzed as “Tentatively Identified Compounds.”
2. The COPCs are ranked in the order of their COPC number. Within the data section for each COPC, data are ranked in the order of survey (1 and 2). Within every survey, data are ranked in the order of inlet and outlet and following the time sequence.
3. Except for mercury, COPC concentrations were converted into parts per million (ppm) using their molecular weights and corresponding flow rates after volume correction as shown in the following equation:

$$C = 24.25 \frac{r}{MV}$$

where C is the concentration of COPC in ppmv; r is the analytical result with units of $\mu\text{g}/\text{sample}$ (if the analytical result unit is expressed in mg/sample , the value of C needs to be multiplied by 1000; if the analytical result unit is in ng/sample the value of C needs to be divided by 1000); V is the collected volume in 2 hours expressed in liters; M is the molecular weight of COPC expressed as g/mol . When the ratio between concentration and the corresponding Occupational Exposure Limit (OEL) is larger than 10%, the fraction is shown in red.

4. The reported volume measurements in Appendix C were made via DryCal devices placed downstream of each sample media tube. This allowed for precise volume measurements through each of the tubes. However, to perform the concentration conversion to ppm, the “actual” volumetric values required conversion to standard temperature and pressure conditions.

Ideal gas behavior was assumed for these volume corrections, and standard temperatures and pressures were assumed to be 298 K (T_{standard}) and 760 Torr (P_{standard}), respectively. For temperatures, the reported upstream temperatures for each time period were used (T_{upstream} , in Kelvin), and the temperature correction factor (i.e., the factor multiplied by each reported volume) was simply $T_{\text{standard}}/T_{\text{upstream}}$.

For the pressure corrections, additional pressure drop information was gathered so that the pressure at the point of the DryCal device could be calculated. Each time step had reported upstream pressures (P_{upstream} , or upstream of the respirator cartridges). Therefore, pressure drop measurements across the respirator cartridge and each sample media tube were performed offline to gather the additional information necessary for the correction.

The average reported pressure drop reading for the respirator cartridge ($P_{\text{cartridge}}$) tested was 3.2 inches of water column (WC). The pressure drop measurements across the individual sample tubes are shown in the table below (all expressed as inches of WC).

The average pressure drops were then used in a pressure correction factor for the reported volumes. Note that all pressure values were first converted to units of Torr. For measurements made at the inlet of the respirator cartridge the pressure correction factor is $(P_{\text{upstream}} - P_{\text{tube}}) \div P_{\text{standard}}$. For measurements made at the outlet of the respirator cartridge the pressure correction factor is $(P_{\text{upstream}} - P_{\text{cartridge}} - P_{\text{tube}}) \div P_{\text{standard}}$.

Tube Location	First Measure (inches of WC, tube on cartridge inlet side)	Second Measure (inches of WC, tube on cartridge outlet side)	Average of Both Measurements (P_{tube} , inches of WC)
A	5.0	12.4	8.7
B	6.9	7.2	7.1
C	2.3	2.5	2.4
D	0.8	0.8	0.8
E	1.9	2.1	2.0
F	3.8	6.8	5.3
G	1.6	1.7	1.7
H	7.7	6.5	7.1
I	5.2	4.0	4.6
J	15.9	16.3	16.1
K	10.1	9.7	9.9

An example calculation of the correction factors follows. For a given time period, assume that the reported upstream pressure (P_{upstream}) was 734 Torr and the corresponding temperature (T_{upstream}) was 85.9°F (or 302.9 K). Here, for tube location ‘A’ and upstream of the respirator cartridge, the corresponding temperature correction factor would be 0.984, and the pressure correction factor for the respirator cartridge outlet would be 0.944. When multiplied, these two factors equal 0.929, which would be the overall correction to the reported volume measurement.

- The analytical detection limit (DL)—or reporting limit in some cases—for every COPC was obtained from the raw analytical data. Here, the average flow rate was used to calculate the approximate analytical DL as the percentage of the OEL for each COPC. Because the flow rates vary, the calculated concentrations were different for each point, even though some of the results are less than the DL in the original reading. The last column in the tables below indicate if the original readings were less than the DL or not.
 - For ammonia and mercury, only the results obtained from using method of total vapor of ammonia and mercury were used.
 - For furan, results from the furan category instead of volatile organic compound (VOC) (or volatile organic analyte) were used. For acetonitrile, results from the VOC category were used. For butanal, the results from the VOC category instead of the aldehydes category were used. For pyridine and 2,4-dimethylpyridine, the results from the VOC category were used.
 - For N-Nitrosodimethylamine (NDMA) and other nitrosamines, data values above analytical DLs for the same time and position were added together because the original sample was diluted into three samples for measurements. This same rule applies to 1,3-Butadiene. The results in the plots and tables reflect the sum of results.

The following tables show the calculated concentrations for each of the COPC measurements conducted in this study. Red highlighted values reflect measurements that were above 10% of the respective OEL values. COPCs with these highlights are plotted and shown in Section 5.0. Orange highlighted values reflect measurements in the 2 to 10% of the OEL range. COPCs with these highlights (only) are plotted and shown in Appendix E.

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBI (ppm)	Fraction of DBI	Measurement + DBI (B/P)	Approx. DBI (B)
1	Ammonia	2	8765-A1	28.9	25	116%		2.6%
1	Ammonia	4	8765-B1	26.5	25	106%		2.6%
1	Ammonia	6	8765-C1	31.8	25	127%		2.5%
1	Ammonia	8	8765-D1	29.6	25	119%		2.5%
1	Ammonia	10	8765-E1	24.9	25	99.7%		2.5%
1	Ammonia	12	8765-F1	2.8	25	11.1%		2.5%
1	Ammonia	14	8765-G1	2.8	25	11.1%		2.5%
1	Ammonia	16	8765-H1	32.5	25	130%		2.5%
1	Ammonia	2	8765-A2	0.60	25	2.40%	YES	2.5%
1	Ammonia	4	8765-B2	0.64	25	2.54%	YES	2.5%
1	Ammonia	6	8765-C2	0.65	25	2.59%	YES	2.5%
1	Ammonia	8	8765-D2	0.64	25	2.57%	YES	2.5%
1	Ammonia	10	8765-E2	1.5	25	6.00%		2.5%
1	Ammonia	12	8765-F2	4.0	25	16.1%		2.5%
1	Ammonia	14	8765-G2	4.3	25	17.4%		2.5%
1	Ammonia	16	8765-H2	7.6	25	30.3%		2.5%
1	Ammonia	2	8766-A1	29.4	25	118%		2.5%
1	Ammonia	4	8766-B1	31.7	25	127%		2.5%
1	Ammonia	6	8766-C1	30.3	25	121%		2.5%
1	Ammonia	8	8766-D1	32.0	25	128%		2.5%
1	Ammonia	10	8766-E1	29.2	25	117%		2.5%
1	Ammonia	12	8766-F1	20.3	25	81.2%		2.5%
1	Ammonia	14	8766-G1	29.4	25	117%		2.5%
1	Ammonia	16	8766-H1	27.0	25	108%		2.5%
1	Ammonia	2	8766-A2	0.61	25	2.43%	YES	2.5%
1	Ammonia	4	8766-B2	0.62	25	2.48%	YES	2.5%
1	Ammonia	6	8766-C2	0.62	25	2.50%	YES	2.5%
1	Ammonia	8	8766-D2	0.58	25	2.33%		2.5%
1	Ammonia	10	8766-E2	1.6	25	6.41%		2.5%
1	Ammonia	12	8766-F2	3.1	25	12.3%		2.5%
1	Ammonia	14	8766-G2	5.2	25	20.8%		2.5%
1	Ammonia	16	8766-H2	8.7	25	34.8%		2.5%
3	Mercury	2	8765-A1	0.0003	0.003	10.0%		7.25%
3	Mercury	4	8765-B1	0.0003	0.003	9.00%		7.25%
3	Mercury	6	8765-C1	0.0003	0.003	10.0%		7.25%
3	Mercury	8	8765-D1	0.0004	0.003	13.3%		7.25%
3	Mercury	10	8765-E1	0.0003	0.003	10.0%		7.25%
3	Mercury	12	8765-F1	0.0003	0.003	11.1%		7.25%
3	Mercury	14	8765-G1	0.0002	0.003	7.00%	YES	7.25%
3	Mercury	16	8765-H1	0.0004	0.003	13.3%		7.25%
3	Mercury	2	8765-A2	0.0002	0.003	6.66%	YES	7.25%
3	Mercury	4	8765-B2	0.0002	0.003	7.00%	YES	7.25%
3	Mercury	6	8765-C2	0.0003	0.003	7.17%	YES	7.25%
3	Mercury	8	8765-D2	0.0002	0.003	7.25%	YES	7.25%
3	Mercury	10	8765-E2	0.0003	0.003	7.14%	YES	7.25%
3	Mercury	12	8765-F2	0.0002	0.003	7.25%	YES	7.25%
3	Mercury	14	8765-G2	0.0003	0.003	7.05%	YES	7.25%
3	Mercury	16	8765-H2	0.0002	0.003	6.99%	YES	7.25%
3	Mercury	2	8766-A1	0.0003	0.003	11.3%		7.25%
3	Mercury	4	8766-B1	0.0003	0.003	13.4%		7.25%
3	Mercury	6	8766-C1	0.0003	0.003	10.0%		7.25%
3	Mercury	8	8766-D1	0.0003	0.003	11.0%		7.25%
3	Mercury	10	8766-E1	0.0003	0.003	11.3%		7.25%
3	Mercury	12	8766-F1	0.0003	0.003	11.2%		7.25%
3	Mercury	14	8766-G1	0.0004	0.003	13.4%		7.25%
3	Mercury	16	8766-H1	0.0005	0.003	16.4%		7.25%
3	Mercury	2	8766-A2	0.0002	0.003	6.66%	YES	7.25%
3	Mercury	4	8766-B2	0.0002	0.003	6.99%	YES	7.25%
3	Mercury	6	8766-C2	0.0002	0.003	6.99%	YES	7.25%
3	Mercury	8	8766-D2	0.0003	0.003	7.04%	YES	7.25%
3	Mercury	10	8766-E2	0.0002	0.003	7.17%	YES	7.25%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement + OI (HLP)	Approx. OEL (H)
3	Mercury	12	8766-F1	0.0002	0.003	7.00%	YES	7.25%
3	Mercury	14	8766-G2	0.0002	0.003	6.94%	YES	7.25%
3	Mercury	16	8766-H2	0.0002	0.003	6.70%	YES	7.25%
4	1,3-Butadiene	2	8765-A1	0.0095	1	1.95%	YES	2.15%
4	1,3-Butadiene	4	8765-B1	0.0096	1	1.96%	YES	2.15%
4	1,3-Butadiene	6	8765-C1	0.0097	1	2.07%	YES	2.15%
4	1,3-Butadiene	8	8765-D1	0.0094	1	2.14%	YES	2.15%
4	1,3-Butadiene	10	8765-E1	0.0095	1	2.15%	YES	2.15%
4	1,3-Butadiene	12	8765-F1	0.0098	1	2.08%	YES	2.15%
4	1,3-Butadiene	14	8765-G1	0.0098	1	1.98%	YES	2.15%
4	1,3-Butadiene	16	8765-H1	0.0095	1	1.95%	YES	2.15%
4	1,3-Butadiene	2	8765-A2	0.0097	1	1.97%	YES	2.15%
4	1,3-Butadiene	4	8765-B2	0.0091	1	2.01%	YES	2.15%
4	1,3-Butadiene	6	8765-C2	0.0095	1	2.05%	YES	2.15%
4	1,3-Butadiene	8	8765-D2	0.0092	1	2.11%	YES	2.15%
4	1,3-Butadiene	10	8765-E2	0.0090	1	2.10%	YES	2.15%
4	1,3-Butadiene	12	8765-F2	0.0098	1	2.08%	YES	2.15%
4	1,3-Butadiene	14	8765-G2	0.0093	1	2.07%	YES	2.15%
4	1,3-Butadiene	16	8765-H2	0.0093	1	1.93%	YES	2.15%
4	1,3-Butadiene	2	8766-A1	0.0099	1	1.99%	YES	2.15%
4	1,3-Butadiene	4	8766-B1	0.0090	1	2.00%	YES	2.15%
4	1,3-Butadiene	6	8766-C1	0.0094	1	2.04%	YES	2.15%
4	1,3-Butadiene	8	8766-D1	0.0090	1	2.00%	YES	2.15%
4	1,3-Butadiene	10	8766-E1	0.0090	1	2.00%	YES	2.15%
4	1,3-Butadiene	12	8766-F1	0.0098	1	1.98%	YES	2.15%
4	1,3-Butadiene	14	8766-G1	0.0092	1	1.92%	YES	2.15%
4	1,3-Butadiene	16	8766-H1	0.0089	1	1.89%	YES	2.15%
4	1,3-Butadiene	2	8766-A2	0.0096	1	1.96%	YES	2.15%
4	1,3-Butadiene	4	8766-B2	0.0098	1	1.98%	YES	2.15%
4	1,3-Butadiene	6	8766-C2	0.0092	1	2.02%	YES	2.15%
4	1,3-Butadiene	8	8766-D2	0.0095	1	2.05%	YES	2.15%
4	1,3-Butadiene	10	8766-E2	0.0096	1	2.06%	YES	2.15%
4	1,3-Butadiene	12	8766-F2	0.0093	1	1.93%	YES	2.15%
4	1,3-Butadiene	14	8766-G2	0.0093	1	1.93%	YES	2.15%
4	1,3-Butadiene	16	8766-H2	0.0090	1	1.90%	YES	2.15%
5	Benzene	2	8765-A1	0.0002	0.3	0.043%		0.027%
5	Benzene	4	8765-B1	0.0002	0.3	0.036%		0.027%
5	Benzene	6	8765-C1	0.0002	0.3	0.038%		0.027%
5	Benzene	8	8765-D1	0.0002	0.3	0.042%		0.027%
5	Benzene	10	8765-E1	0.0002	0.3	0.039%		0.027%
5	Benzene	12	8765-F1	0.0002	0.3	0.044%		0.027%
5	Benzene	14	8765-G1	0.0001	0.3	0.029%		0.027%
5	Benzene	16	8765-H1	0.0002	0.3	0.036%		0.027%
5	Benzene	2	8765-A2	0.0001	0.3	0.021%	YES	0.027%
5	Benzene	4	8765-B2	0.0001	0.3	0.022%	YES	0.027%
5	Benzene	6	8765-C2	0.0001	0.3	0.023%	YES	0.027%
5	Benzene	8	8765-D2	0.0001	0.3	0.022%	YES	0.027%
5	Benzene	10	8765-E2	0.0001	0.3	0.020%	YES	0.027%
5	Benzene	12	8765-F2	0.0001	0.3	0.022%	YES	0.027%
5	Benzene	14	8765-G2	0.0001	0.3	0.021%	YES	0.027%
5	Benzene	16	8765-H2	0.0001	0.3	0.020%	YES	0.027%
5	Benzene	2	8766-A1	0.0002	0.3	0.044%		0.027%
5	Benzene	4	8766-B1	0.0003	0.3	0.063%		0.027%
5	Benzene	6	8766-C1	0.0002	0.3	0.043%		0.027%
5	Benzene	8	8766-D1	0.0002	0.3	0.048%		0.027%
5	Benzene	10	8766-E1	0.0003	0.3	0.037%		0.027%
5	Benzene	12	8766-F1	0.0002	0.3	0.049%		0.027%
5	Benzene	14	8766-G1	0.0003	0.3	0.044%		0.027%
5	Benzene	16	8766-H1	0.0003	0.3	0.060%		0.027%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < C ₁ (H ₁ F)	Approx. OEL (H)
5	Benzene	2	8766-A2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	4	8766-B2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	6	8766-C2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	8	8766-D0	0.0001	0.5	0.024%	YES	0.027%
5	Benzene	10	8766-E2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	12	8766-F2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	14	8766-G2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	16	8766-H2	0.0001	0.5	0.023%	YES	0.027%
6	Biphenyl	2	8765-A1	0.0002	0.2	0.098%	YES	0.092%
6	Biphenyl	4	8765-B1	0.0002	0.2	0.096%	YES	0.092%
6	Biphenyl	6	8765-C1	0.0006	0.2	0.280%	YES	0.092%
6	Biphenyl	8	8765-D0	0.0002	0.2	0.094%	YES	0.092%
6	Biphenyl	10	8765-E1	0.0002	0.2	0.092%	YES	0.092%
6	Biphenyl	12	8765-F1	0.0002	0.2	0.092%	YES	0.092%
6	Biphenyl	14	8765-G1	0.0002	0.2	0.096%	YES	0.092%
6	Biphenyl	16	8765-H1	0.0002	0.2	0.087%	YES	0.092%
6	Biphenyl	2	8765-A2	0.0002	0.2	0.093%	YES	0.092%
6	Biphenyl	4	8765-B2	0.0002	0.2	0.093%	YES	0.092%
6	Biphenyl	6	8765-C2	0.0002	0.2	0.094%	YES	0.092%
6	Biphenyl	8	8765-D2	0.0002	0.2	0.094%	YES	0.092%
6	Biphenyl	10	8765-E2	0.0004	0.2	0.188%	YES	0.092%
6	Biphenyl	12	8765-F2	0.0002	0.2	0.092%	YES	0.092%
6	Biphenyl	14	8765-G2	0.0012	0.2	0.602%	YES	0.092%
6	Biphenyl	16	8765-H2	0.0002	0.2	0.092%	YES	0.092%
6	Biphenyl	2	8766-A1	0.0002	0.2	0.097%	YES	0.092%
6	Biphenyl	4	8766-B1	0.0002	0.2	0.097%	YES	0.092%
6	Biphenyl	6	8766-C1	0.0002	0.2	0.098%	YES	0.092%
6	Biphenyl	8	8766-D0	0.0002	0.2	0.093%	YES	0.092%
6	Biphenyl	10	8766-E1	0.0002	0.2	0.095%	YES	0.092%
6	Biphenyl	12	8766-F1	0.0002	0.2	0.093%	YES	0.092%
6	Biphenyl	14						0.092%
6	Biphenyl	16	8766-H1	0.0002	0.2	0.090%	YES	0.092%
6	Biphenyl	2	8766-A2	0.0002	0.2	0.099%	YES	0.092%
6	Biphenyl	4	8766-B2	0.0002	0.2	0.099%	YES	0.092%
6	Biphenyl	6	8766-C2	0.0002	0.2	0.099%	YES	0.092%
6	Biphenyl	8						0.092%
6	Biphenyl	10	8766-E2	0.0002	0.2	0.097%	YES	0.092%
6	Biphenyl	12	8766-F2	0.0002	0.2	0.090%	YES	0.092%
6	Biphenyl	14	8766-G2	0.0002	0.2	0.079%	YES	0.092%
6	Biphenyl	16	8766-H2	0.0002	0.2	0.077%	YES	0.092%
7	1-Butanol	2	8765-A1	0.0278	20	0.139%		0.004%
7	1-Butanol	4	8765-B1	0.0298	20	0.149%		0.004%
7	1-Butanol	6	8765-C1	0.0343	20	0.172%		0.004%
7	1-Butanol	8	8765-D0	0.0368	20	0.184%		0.004%
7	1-Butanol	10	8765-E1	0.0388	20	0.194%		0.004%
7	1-Butanol	12	8765-F1	0.0390	20	0.195%		0.004%
7	1-Butanol	14	8765-G1	0.0398	20	0.199%		0.004%
7	1-Butanol	16	8765-H1	0.0388	20	0.194%		0.004%
7	1-Butanol	2	8765-A2	0.0008	20	0.004%		0.004%
7	1-Butanol	4	8765-B2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	6	8765-C2	0.0009	20	0.004%	YES	0.004%
7	1-Butanol	8	8765-D2	0.0011	20	0.005%		0.004%
7	1-Butanol	10	8765-E2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	12	8765-F2	0.0024	20	0.012%		0.004%
7	1-Butanol	14	8765-G2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	16	8765-H2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	2	8766-A1	0.0342	20	0.171%		0.004%
7	1-Butanol	4	8766-B1	0.0393	20	0.197%		0.004%
7	1-Butanol	6	8766-C1	0.0385	20	0.192%		0.004%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OH (ppm)	Fraction of OH	Measurement + CI (RL)	Approx. OH (RL)
7	1-Butanol	8	8766-01	0.0045	20	0.170%		0.004%
7	1-Butanol	10	8766-11	0.0001	20	0.192%		0.004%
7	1-Butanol	12	8766-F1	0.0027	20	0.148%		0.004%
7	1-Butanol	14	8766-01	0.0034	20	0.167%		0.004%
7	1-Butanol	16	8766-H1	0.0060	20	0.130%		0.004%
7	1-Butanol	2	8766-A2	0.0005	20	0.000%		0.004%
7	1-Butanol	4	8766-B2	0.0005	20	0.002%		0.004%
7	1-Butanol	6	8766-C2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	8	8766-02	0.0005	20	0.000%		0.004%
7	1-Butanol	10	8766-E2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	12	8766-F2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	14	8766-02	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	16	8766-H2	0.0003	20	0.002%	YES	0.004%
9	2-Hexanone	2	8765-A1	0.00012	5	0.002%		0.004%
9	2-Hexanone	4	8765-B1	0.00013	5	0.000%		0.004%
9	2-Hexanone	6	8765-C1	0.00014	5	0.000%		0.004%
9	2-Hexanone	8	8765-01	0.00013	5	0.000%		0.004%
9	2-Hexanone	10	8765-E1	0.00011	5	0.002%		0.004%
9	2-Hexanone	12	8765-F1	0.00011	5	0.002%		0.004%
9	2-Hexanone	14	8765-01	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	16	8765-H1	0.00008	5	0.002%		0.004%
9	2-Hexanone	2	8765-A2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	4	8765-B2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	6	8765-C2	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	8	8765-02	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	10	8765-E2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	12	8765-F2	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	14	8765-02	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	16	8765-H2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	2	8766-A1	0.00014	5	0.000%	YES	0.004%
9	2-Hexanone	4	8766-B1	0.00016	5	0.000%		0.004%
9	2-Hexanone	6	8766-C1	0.00022	5	0.004%		0.004%
9	2-Hexanone	8	8766-01	0.00010	5	0.002%		0.004%
9	2-Hexanone	10	8766-E1	0.00010	5	0.002%		0.004%
9	2-Hexanone	12	8766-F1	0.00010	5	0.002%		0.004%
9	2-Hexanone	14	8766-01	0.00011	5	0.002%		0.004%
9	2-Hexanone	16	8766-H1	0.00017	5	0.000%	YES	0.004%
9	2-Hexanone	2	8766-A2	0.00017	5	0.000%	YES	0.004%
9	2-Hexanone	4	8766-B2	0.00017	5	0.000%	YES	0.004%
9	2-Hexanone	6	8766-C2	0.00017	5	0.000%	YES	0.004%
9	2-Hexanone	8	8766-02	0.00016	5	0.000%	YES	0.004%
9	2-Hexanone	10	8766-E2	0.00017	5	0.000%	YES	0.004%
9	2-Hexanone	12	8766-F2	0.00018	5	0.004%	YES	0.004%
9	2-Hexanone	14	8766-02	0.00018	5	0.004%	YES	0.004%
9	2-Hexanone	16	8766-H2	0.00015	5	0.000%	YES	0.004%
11	4-Methyl-2-hexanone	2	8763-A1	0.00007	0.3	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	4	8763-B1	0.00007	0.3	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	6	8763-C1	0.00007	0.3	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	8	8763-01	0.00008	0.3	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	10	8763-E1	0.00008	0.3	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	12	8763-F1	0.00023	0.3	0.047%		0.032%
11	4-Methyl-2-hexanone	14	8763-01	0.00023	0.3	0.040%		0.032%
11	4-Methyl-2-hexanone	16	8763-H1	0.00008	0.3	0.010%	YES	0.032%
11	4-Methyl-2-hexanone	2	8763-A2	0.00008	0.3	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	4	8763-B2	0.00008	0.3	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	6	8763-C2	0.00009	0.3	0.017%	YES	0.032%
11	4-Methyl-2-hexanone	8	8763-02	0.00008	0.3	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	10	8763-E2	0.00007	0.3	0.015%	YES	0.032%
11	4-Methyl-2-hexanone	12	8763-F2	0.00008	0.3	0.017%	YES	0.032%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OH1 (ppm)	Fraction of OH1	Measurement + OH1 (M7)	Approx. OH1 (M)
11	4-Methyl-2-hexanone	14	8765-G2	0.00008	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	16	8765-H2	0.00008	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	2	8766-A1	0.00013	0.5	0.026%	YES	0.012%
11	4-Methyl-2-hexanone	4	8766-B1	0.00007	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	6	8766-C1	0.00008	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	8	8766-D0	0.00008	0.5	0.015%	YES	0.012%
11	4-Methyl-2-hexanone	10	8766-E1	0.00008	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	12	8766-F1	0.00008	0.5	0.016%	YES	0.012%
11	4-Methyl-2-hexanone	14	8766-G1	0.00008	0.5	0.018%	YES	0.012%
11	4-Methyl-2-hexanone	16	8766-H1	0.00015	0.5	0.030%	YES	0.012%
11	4-Methyl-2-hexanone	2	8766-A2	0.00016	0.5	0.032%	YES	0.012%
11	4-Methyl-2-hexanone	4	8766-B2	0.00015	0.5	0.030%	YES	0.012%
11	4-Methyl-2-hexanone	6	8766-C2	0.00015	0.5	0.032%	YES	0.012%
11	4-Methyl-2-hexanone	8	8766-D2	0.00014	0.5	0.028%	YES	0.012%
11	4-Methyl-2-hexanone	10	8766-E2	0.00015	0.5	0.032%	YES	0.012%
11	4-Methyl-2-hexanone	12	8766-F2	0.00016	0.5	0.032%	YES	0.012%
11	4-Methyl-2-hexanone	14	8766-G2	0.00016	0.5	0.032%	YES	0.012%
11	4-Methyl-2-hexanone	16	8766-H2	0.00013	0.5	0.027%	YES	0.012%
13	3-Buten-2-one	2	8765-A1	0.00014	0.2	0.072%	YES	0.096%
13	3-Buten-2-one	4	8765-B1	0.00090	0.2	0.450%		0.096%
13	3-Buten-2-one	6	8765-C1	0.00015	0.2	0.075%	YES	0.096%
13	3-Buten-2-one	8	8765-D0	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	10	8765-E1	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	12	8765-F1	0.00023	0.2	0.124%		0.096%
13	3-Buten-2-one	14	8765-G1	0.00016	0.2	0.080%	YES	0.096%
13	3-Buten-2-one	16	8765-H1	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	2	8765-A2	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	4	8765-B2	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	6	8765-C2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	8	8765-D2	0.00017	0.2	0.087%	YES	0.096%
13	3-Buten-2-one	10	8765-E2	0.00016	0.2	0.079%	YES	0.096%
13	3-Buten-2-one	12	8765-F2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	14	8765-G2	0.00017	0.2	0.084%	YES	0.096%
13	3-Buten-2-one	16	8765-H2	0.00016	0.2	0.080%	YES	0.096%
13	3-Buten-2-one	2	8766-A1	0.00091	0.2	0.454%		0.096%
13	3-Buten-2-one	4	8766-B1	0.00082	0.2	0.408%		0.096%
13	3-Buten-2-one	6	8766-C1	0.00020	0.2	0.100%		0.096%
13	3-Buten-2-one	8	8766-D0	0.00023	0.2	0.115%		0.096%
13	3-Buten-2-one	10	8766-E1	0.00023	0.2	0.114%		0.096%
13	3-Buten-2-one	12	8766-F1	0.00026	0.2	0.132%		0.096%
13	3-Buten-2-one	14	8766-G1	0.00021	0.2	0.105%		0.096%
13	3-Buten-2-one	16	8766-H1	0.00090	0.2	0.450%		0.096%
13	3-Buten-2-one	2	8766-A2	0.00019	0.2	0.094%	YES	0.096%
13	3-Buten-2-one	4	8766-B2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	6	8766-C2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	8	8766-D2	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	10	8766-E2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	12	8766-F2	0.00019	0.2	0.095%	YES	0.096%
13	3-Buten-2-one	14	8766-G2	0.00019	0.2	0.095%	YES	0.096%
13	3-Buten-2-one	16	8766-H2	0.00018	0.2	0.090%	YES	0.096%
14	Formaldehyde	2	8765-A1	0.0033	0.3	4.17%		0.62%
14	Formaldehyde	4	8765-B1	0.0043	0.3	1.43%		0.62%
14	Formaldehyde	6	8765-C1	0.0037	0.3	1.81%		0.62%
14	Formaldehyde	8	8765-D0	0.0047	0.3	1.56%		0.62%
14	Formaldehyde	10	8765-E1	0.0030	0.3	1.00%		0.62%
14	Formaldehyde	12	8765-F1	0.0069	0.3	2.30%		0.62%
14	Formaldehyde	14	8765-G1	0.0021	0.3	0.69%		0.62%
14	Formaldehyde	16	8765-H1	0.0049	0.3	1.65%		0.62%
14	Formaldehyde	2	8765-A2	0.0029	0.3	0.83%		0.62%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBL (ppm)	Fraction of DBL	Measurement < DBL (BLP)	Approx. DBL (BL)
24	Formaldehyde	4	8765-B2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	6	8765-C2	0.0020	0.3	0.66%		0.62%
24	Formaldehyde	8	8765-D2	0.0019	0.3	0.62%	YES	0.62%
24	Formaldehyde	10	8765-E2	0.0019	0.3	0.62%	YES	0.62%
24	Formaldehyde	12	8765-F2	0.0022	0.3	0.74%		0.62%
24	Formaldehyde	14	8765-G2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	16	8765-H2	0.0018	0.3	0.59%	YES	0.62%
24	Formaldehyde	2	8766-A1	0.0115	0.3	3.84%		0.62%
24	Formaldehyde	4	8766-B1	0.0112	0.3	3.73%		0.62%
24	Formaldehyde	6	8766-C1	0.0094	0.3	3.12%		0.62%
24	Formaldehyde	8	8766-D1	0.0061	0.3	2.04%		0.62%
24	Formaldehyde	10	8766-E1	0.0032	0.3	1.07%		0.62%
24	Formaldehyde	12	8766-F1	0.0029	0.3	0.97%		0.62%
24	Formaldehyde	14	8766-G1	0.0028	0.3	0.95%		0.62%
24	Formaldehyde	16	8766-H1	0.0029	0.3	0.97%		0.62%
24	Formaldehyde	2	8766-A2	0.0022	0.3	0.73%		0.62%
24	Formaldehyde	4	8766-B2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	6	8766-C2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	8	8766-D2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	10	8766-E2	0.0018	0.3	0.61%	YES	0.62%
24	Formaldehyde	12	8766-F2	0.0018	0.3	0.59%	YES	0.62%
24	Formaldehyde	14	8766-G2	0.0018	0.3	0.59%	YES	0.62%
24	Formaldehyde	16	8766-H2	0.0017	0.3	0.58%	YES	0.62%
25	Acetaldehyde	2	8765-A1	0.0047	25	0.009%		0.003%
25	Acetaldehyde	4	8765-B1	0.0044	25	0.008%		0.003%
25	Acetaldehyde	6	8765-C1	0.0031	25	0.006%		0.003%
25	Acetaldehyde	8	8765-D1	0.0047	25	0.009%		0.003%
25	Acetaldehyde	10	8765-E1	0.0036	25	0.007%		0.003%
25	Acetaldehyde	12	8765-F1	0.0044	25	0.008%		0.003%
25	Acetaldehyde	14	8765-G1	0.0029	25	0.012%		0.003%
25	Acetaldehyde	16	8765-H1	0.0037	25	0.005%		0.003%
25	Acetaldehyde	2	8765-A2	0.0077	25	0.012%		0.003%
25	Acetaldehyde	4	8765-B2	0.0072	25	0.029%		0.003%
25	Acetaldehyde	6	8765-C2	0.0090	25	0.036%		0.003%
25	Acetaldehyde	8	8765-D2	0.0092	25	0.037%		0.003%
25	Acetaldehyde	10	8765-E2	0.0084	25	0.034%		0.003%
25	Acetaldehyde	12	8765-F2	0.0093	25	0.037%		0.003%
25	Acetaldehyde	14	8765-G2	0.0069	25	0.028%		0.003%
25	Acetaldehyde	16	8765-H2	0.0085	25	0.034%		0.003%
25	Acetaldehyde	2	8766-A1	0.0126	25	0.054%		0.003%
25	Acetaldehyde	4	8766-B1	0.0143	25	0.057%		0.003%
25	Acetaldehyde	6	8766-C1	0.0131	25	0.052%		0.003%
25	Acetaldehyde	8	8766-D1	0.0135	25	0.054%		0.003%
25	Acetaldehyde	10	8766-E1	0.0130	25	0.052%		0.003%
25	Acetaldehyde	12	8766-F1	0.0128	25	0.052%		0.003%
25	Acetaldehyde	14	8766-G1	0.0125	25	0.050%		0.003%
25	Acetaldehyde	16	8766-H1	0.0131	25	0.052%		0.003%
25	Acetaldehyde	2	8766-A2	0.0069	25	0.028%		0.003%
25	Acetaldehyde	4	8766-B2	0.0089	25	0.036%		0.003%
25	Acetaldehyde	6	8766-C2	0.0084	25	0.034%		0.003%
25	Acetaldehyde	8	8766-D2	0.0090	25	0.036%		0.003%
25	Acetaldehyde	10	8766-E2	0.0072	25	0.029%		0.003%
25	Acetaldehyde	12	8766-F2	0.0080	25	0.032%		0.003%
25	Acetaldehyde	14	8766-G2	0.0075	25	0.030%		0.003%
25	Acetaldehyde	16	8766-H2	0.0071	25	0.029%		0.003%
26	Butanal	2	8765-A1	0.00043	25	0.002%		0.001%
26	Butanal	4	8765-B1	0.00034	25	0.001%		0.001%
26	Butanal	6	8765-C1	0.00028	25	0.001%		0.001%
26	Butanal	8	8765-D1	0.00039	25	0.002%		0.001%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < OEL (H) ?	Approx. OEL (H)
16	Butanal	10	8763-E1	0.00010	10	0.002%		0.001%
16	Butanal	12	8763-F1	0.00049	10	0.002%		0.001%
16	Butanal	14	8763-G1	0.00019	10	0.002%	YES	0.001%
16	Butanal	16	8763-H1	0.00019	10	0.002%	YES	0.001%
16	Butanal	2	8763-A2	0.00013	10	0.002%		0.001%
16	Butanal	4	8763-B2	0.00010	10	0.002%	YES	0.001%
16	Butanal	6	8763-C2	0.00011	10	0.002%	YES	0.001%
16	Butanal	8	8763-D2	0.00011	10	0.002%	YES	0.001%
16	Butanal	10	8763-E2	0.00019	10	0.002%	YES	0.001%
16	Butanal	12	8763-F2	0.00011	10	0.002%	YES	0.001%
16	Butanal	14	8763-G2	0.00010	10	0.002%	YES	0.001%
16	Butanal	16	8763-H2	0.00019	10	0.002%	YES	0.001%
16	Butanal	2	8764-A1	0.00015	10	0.002%		0.001%
16	Butanal	4	8764-B1	0.00018	10	0.002%	YES	0.001%
16	Butanal	6	8764-C1	0.00047	10	0.002%		0.001%
16	Butanal	8	8764-D1	0.00010	10	0.002%		0.001%
16	Butanal	10	8764-E1	0.00040	10	0.002%		0.001%
16	Butanal	12	8764-F1	0.00010	10	0.002%	YES	0.001%
16	Butanal	14	8764-G1	0.00016	10	0.002%		0.001%
16	Butanal	16	8764-H1	0.00018	10	0.002%	YES	0.001%
16	Butanal	2	8764-A2	0.00019	10	0.002%	YES	0.001%
16	Butanal	4	8764-B2	0.00018	10	0.002%	YES	0.001%
16	Butanal	6	8764-C2	0.00018	10	0.002%	YES	0.001%
16	Butanal	8	8764-D2	0.00016	10	0.002%	YES	0.001%
16	Butanal	10	8764-E2	0.00018	10	0.002%	YES	0.001%
16	Butanal	12	8764-F2	0.00019	10	0.002%	YES	0.001%
16	Butanal	14	8764-G2	0.00019	10	0.002%	YES	0.001%
16	Butanal	16	8764-H2	0.00014	10	0.002%	YES	0.001%
19	Furan	2	8765-A1	0.000054	0.001	5.41%	YES	5.41%
19	Furan	4	8765-B1	0.000053	0.001	5.30%	YES	5.31%
19	Furan	6	8765-C1	0.000053	0.001	5.29%	YES	5.31%
19	Furan	8	8765-D1	0.000055	0.001	5.47%	YES	5.41%
19	Furan	10	8765-E1	0.000055	0.001	5.54%	YES	5.41%
19	Furan	12	8765-F1	0.000055	0.001	5.53%	YES	5.41%
19	Furan	14	8765-G1	0.000054	0.001	5.43%	YES	5.41%
19	Furan	16	8765-H1	0.000055	0.001	5.47%	YES	5.41%
19	Furan	2	8765-A2	0.000056	0.001	5.58%	YES	5.41%
19	Furan	4	8765-B2	0.000055	0.001	5.49%	YES	5.41%
19	Furan	6	8765-C2	0.000055	0.001	5.49%	YES	5.41%
19	Furan	8	8765-D2	0.000055	0.001	5.49%	YES	5.41%
19	Furan	10	8765-E2	0.000055	0.001	5.51%	YES	5.41%
19	Furan	12	8765-F2	0.000056	0.001	5.61%	YES	5.41%
19	Furan	14	8765-G2	0.000056	0.001	5.63%	YES	5.41%
19	Furan	16	8765-H2	0.000056	0.001	5.63%	YES	5.41%
19	Furan	2	8766-A1	0.000052	0.001	5.19%	YES	5.41%
19	Furan	4	8766-B1	0.000053	0.001	5.30%	YES	5.41%
19	Furan	6	8766-C1	0.000057	0.001	5.73%	YES	5.41%
19	Furan	8	8766-D1	0.000057	0.001	5.73%	YES	5.41%
19	Furan	10	8766-E1	0.000057	0.001	5.74%	YES	5.41%
19	Furan	12	8766-F1	0.000058	0.001	5.79%	YES	5.41%
19	Furan	14	8766-G1	0.000058	0.001	5.81%	YES	5.41%
19	Furan	16	8766-H1	0.000055	0.001	5.53%	YES	5.41%
19	Furan	2	8766-A2	0.000054	0.001	5.41%	YES	5.41%
19	Furan	4	8766-B2	0.000058	0.001	5.77%	YES	5.41%
19	Furan	6	8766-C2	0.000057	0.001	5.69%	YES	5.41%
19	Furan	8	8766-D2	0.000058	0.001	5.79%	YES	5.41%
19	Furan	10	8766-E2	0.000059	0.001	5.89%	YES	5.41%
19	Furan	12						5.41%
19	Furan	14	8766-G2	0.000055	0.001	5.53%	YES	5.41%
19	Furan	16	8766-H2	0.000058	0.001	5.81%	YES	5.41%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DEL (ppm)	Fraction of DEL	Measurement < DEL (BLP)	Approx. DEL (BL)
20	2,3-Dihydrofuran	2	8765-A1	0.000029	0.001	2.91%	YES	3.11%
20	2,3-Dihydrofuran	4	8765-B1	0.000028	0.001	2.84%	YES	3.11%
20	2,3-Dihydrofuran	6	8765-C1	0.000028	0.001	2.80%	YES	3.11%
20	2,3-Dihydrofuran	8	8765-D0	0.000029	0.001	2.93%	YES	3.11%
20	2,3-Dihydrofuran	10	8765-E1	0.000030	0.001	2.97%	YES	3.11%
20	2,3-Dihydrofuran	12	8765-F1	0.000030	0.001	2.97%	YES	3.11%
20	2,3-Dihydrofuran	14	8765-G1	0.000029	0.001	2.91%	YES	3.11%
20	2,3-Dihydrofuran	16	8765-H0	0.000029	0.001	2.93%	YES	3.11%
20	2,3-Dihydrofuran	2	8765-A2	0.000018	0.001	1.82%	YES	3.11%
20	2,3-Dihydrofuran	4	8765-B2	0.000019	0.001	1.86%	YES	3.11%
20	2,3-Dihydrofuran	6	8765-C2	0.000019	0.001	1.85%	YES	3.11%
20	2,3-Dihydrofuran	8	8765-D2	0.000019	0.001	1.87%	YES	3.11%
20	2,3-Dihydrofuran	10	8765-E2	0.000019	0.001	1.88%	YES	3.11%
20	2,3-Dihydrofuran	12	8765-F2	0.000019	0.001	1.89%	YES	3.11%
20	2,3-Dihydrofuran	14	8765-G2	0.000019	0.001	1.90%	YES	3.11%
20	2,3-Dihydrofuran	16	8765-H2	0.000020	0.001	1.95%	YES	3.11%
20	2,3-Dihydrofuran	2	8766-A1	0.000028	0.001	2.78%	YES	3.11%
20	2,3-Dihydrofuran	4	8766-B1	0.000028	0.001	2.84%	YES	3.11%
20	2,3-Dihydrofuran	6	8766-C1	0.000020	0.001	2.00%	YES	3.11%
20	2,3-Dihydrofuran	8	8766-D0	0.000031	0.001	3.07%	YES	3.11%
20	2,3-Dihydrofuran	10	8766-E1	0.000031	0.001	3.07%	YES	3.11%
20	2,3-Dihydrofuran	12	8766-F1	0.000031	0.001	3.10%	YES	3.11%
20	2,3-Dihydrofuran	14	8766-G1	0.000031	0.001	3.11%	YES	3.11%
20	2,3-Dihydrofuran	16	8766-H0	0.000019	0.001	1.89%	YES	3.11%
20	2,3-Dihydrofuran	2	8766-A2	0.000018	0.001	1.82%	YES	3.11%
20	2,3-Dihydrofuran	4	8766-B2	0.000020	0.001	2.00%	YES	3.11%
20	2,3-Dihydrofuran	6	8766-C2	0.000031	0.001	3.05%	YES	3.11%
20	2,3-Dihydrofuran	8	8766-D2	0.000020	0.001	2.00%	YES	3.11%
20	2,3-Dihydrofuran	10	8766-E2	0.000021	0.001	2.07%	YES	3.11%
20	2,3-Dihydrofuran	12						3.11%
20	2,3-Dihydrofuran	14	8766-G2	0.000019	0.001	1.89%	YES	3.11%
20	2,3-Dihydrofuran	16	8766-H2	0.000031	0.001	3.11%	YES	3.11%
21	2,3-Dihydrofuran	2	8765-A1	0.000048	0.001	4.81%		4.38%
21	2,3-Dihydrofuran	4	8765-B1	0.000027	0.001	26.7%		4.38%
21	2,3-Dihydrofuran	6	8765-C1	0.000040	0.001	3.97%	YES	4.38%
21	2,3-Dihydrofuran	8	8765-D0	0.000043	0.001	4.30%		4.38%
21	2,3-Dihydrofuran	10	8765-E1	0.000040	0.001	4.01%		4.38%
21	2,3-Dihydrofuran	12	8765-F1	0.000033	0.001	3.27%		4.38%
21	2,3-Dihydrofuran	14	8765-G1	0.000041	0.001	4.10%	YES	4.38%
21	2,3-Dihydrofuran	16	8765-H0	0.000041	0.001	4.12%	YES	4.38%
21	2,3-Dihydrofuran	2	8765-A2	0.000027	0.001	2.70%	YES	4.38%
21	2,3-Dihydrofuran	4	8765-B2	0.000026	0.001	2.61%	YES	4.38%
21	2,3-Dihydrofuran	6	8765-C2	0.000026	0.001	2.61%	YES	4.38%
21	2,3-Dihydrofuran	8	8765-D2	0.000026	0.001	2.61%	YES	4.38%
21	2,3-Dihydrofuran	10	8765-E2	0.000026	0.001	2.63%	YES	4.38%
21	2,3-Dihydrofuran	12	8765-F2	0.000027	0.001	2.72%	YES	4.38%
21	2,3-Dihydrofuran	14	8765-G2	0.000027	0.001	2.68%	YES	4.38%
21	2,3-Dihydrofuran	16	8765-H2	0.000027	0.001	2.75%	YES	4.38%
21	2,3-Dihydrofuran	2	8766-A1	0.000039	0.001	3.91%	YES	4.38%
21	2,3-Dihydrofuran	4	8766-B1	0.000040	0.001	3.99%	YES	4.38%
21	2,3-Dihydrofuran	6	8766-C1	0.000028	0.001	2.81%	YES	4.38%
21	2,3-Dihydrofuran	8	8766-D0	0.000043	0.001	4.31%	YES	4.38%
21	2,3-Dihydrofuran	10	8766-E1	0.000043	0.001	4.32%	YES	4.38%
21	2,3-Dihydrofuran	12	8766-F1	0.000044	0.001	4.36%	YES	4.38%
21	2,3-Dihydrofuran	14	8766-G1	0.000044	0.001	4.37%	YES	4.38%
21	2,3-Dihydrofuran	16	8766-H0	0.000027	0.001	2.65%	YES	4.38%
21	2,3-Dihydrofuran	2	8766-A2	0.000026	0.001	2.57%	YES	4.38%
21	2,3-Dihydrofuran	4	8766-B2	0.000028	0.001	2.84%	YES	4.38%
21	2,3-Dihydrofuran	6	8766-C2	0.000043	0.001	4.29%	YES	4.38%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBL (ppm)	Fraction of DBL	Measurement + DBL (ppm)	Approx. DBL (ppm)
21	2,5-Dihydrofuran	8	8766-00	0.000029	0.001	2.88%	YES	4.38%
21	2,5-Dihydrofuran	10	8766-02	0.000029	0.001	2.91%	YES	4.38%
21	2,5-Dihydrofuran	13						4.38%
21	2,5-Dihydrofuran	14	8766-03	0.000027	0.001	2.68%	YES	4.38%
21	2,5-Dihydrofuran	16	8766-H2	0.000044	0.001	4.38%	YES	4.38%
22	1-Methylfuran	2	8765-A1	0.000012	0.001	1.26%	YES	1.25%
22	1-Methylfuran	4	8765-B1	0.000011	0.001	1.24%		1.25%
22	1-Methylfuran	6	8765-C1	0.000011	0.001	1.19%	YES	1.25%
22	1-Methylfuran	8	8765-01	0.000013	0.001	1.33%		1.25%
22	1-Methylfuran	10	8765-F1	0.000012	0.001	1.19%	YES	1.25%
22	1-Methylfuran	12	8765-F1	0.000012	0.001	1.19%	YES	1.25%
22	1-Methylfuran	14	8765-G1	0.000012	0.001	1.17%	YES	1.25%
22	1-Methylfuran	16	8765-H1	0.000012	0.001	1.17%	YES	1.25%
22	1-Methylfuran	2	8765-A2	0.000008	0.001	0.77%	YES	1.25%
22	1-Methylfuran	4	8765-B2	0.000007	0.001	0.76%	YES	1.25%
22	1-Methylfuran	6	8765-C2	0.000015	0.001	1.53%		1.25%
22	1-Methylfuran	8	8765-02	0.000007	0.001	0.75%	YES	1.25%
22	1-Methylfuran	10	8765-E2	0.000008	0.001	0.75%	YES	1.25%
22	1-Methylfuran	12	8765-F2	0.000008	0.001	0.77%	YES	1.25%
22	1-Methylfuran	14	8765-G2	0.000008	0.001	0.76%	YES	1.25%
22	1-Methylfuran	16	8765-H2	0.000008	0.001	0.76%	YES	1.25%
22	1-Methylfuran	2	8766-A1	0.000011	0.001	1.11%	YES	1.25%
22	1-Methylfuran	4	8766-B1	0.000011	0.001	1.14%	YES	1.25%
22	1-Methylfuran	6	8766-C1	0.000008	0.001	0.80%	YES	1.25%
22	1-Methylfuran	8	8766-01	0.000012	0.001	1.23%	YES	1.25%
22	1-Methylfuran	10	8766-E1	0.000012	0.001	1.23%	YES	1.25%
22	1-Methylfuran	12	8766-F1	0.000012	0.001	1.24%	YES	1.25%
22	1-Methylfuran	14	8766-G1	0.000012	0.001	1.24%	YES	1.25%
22	1-Methylfuran	16	8766-H1	0.000008	0.001	0.76%	YES	1.25%
22	1-Methylfuran	2	8766-A2	0.000009	0.001	0.88%		1.25%
22	1-Methylfuran	4	8766-B2	0.000008	0.001	0.81%	YES	1.25%
22	1-Methylfuran	6	8766-C2	0.000012	0.001	1.23%	YES	1.25%
22	1-Methylfuran	8	8766-02	0.000008	0.001	0.81%	YES	1.25%
22	1-Methylfuran	10	8766-E2	0.000008	0.001	0.83%	YES	1.25%
22	1-Methylfuran	12						1.25%
22	1-Methylfuran	14	8766-G2	0.000008	0.001	0.76%	YES	1.25%
22	1-Methylfuran	16	8766-H2	0.000012	0.001	1.23%	YES	1.25%
23	2,5-Dimethylfuran	2	8765-A1	0.000017	0.001	1.73%	YES	1.64%
23	2,5-Dimethylfuran	4	8765-B1	0.000017	0.001	1.68%	YES	1.64%
23	2,5-Dimethylfuran	6	8765-C1	0.000017	0.001	1.67%	YES	1.64%
23	2,5-Dimethylfuran	8	8765-01	0.000017	0.001	1.73%	YES	1.64%
23	2,5-Dimethylfuran	10	8765-E1	0.000018	0.001	1.76%	YES	1.64%
23	2,5-Dimethylfuran	12	8765-F1	0.000018	0.001	1.76%	YES	1.64%
23	2,5-Dimethylfuran	14	8765-G1	0.000017	0.001	1.73%	YES	1.64%
23	2,5-Dimethylfuran	16	8765-H1	0.000017	0.001	1.73%	YES	1.64%
23	2,5-Dimethylfuran	2	8765-A2	0.000011	0.001	1.24%	YES	1.64%
23	2,5-Dimethylfuran	4	8765-B2	0.000011	0.001	1.19%	YES	1.64%
23	2,5-Dimethylfuran	6	8765-C2	0.000011	0.001	1.19%	YES	1.64%
23	2,5-Dimethylfuran	8	8765-02	0.000011	0.001	1.11%	YES	1.64%
23	2,5-Dimethylfuran	10	8765-E2	0.000011	0.001	1.21%	YES	1.64%
23	2,5-Dimethylfuran	12	8765-F2	0.000011	0.001	1.14%	YES	1.64%
23	2,5-Dimethylfuran	14	8765-G2	0.000011	0.001	1.13%	YES	1.64%
23	2,5-Dimethylfuran	16	8765-H2	0.000012	0.001	1.16%	YES	1.64%
23	2,5-Dimethylfuran	2	8766-A1	0.000016	0.001	1.65%	YES	1.64%
23	2,5-Dimethylfuran	4	8766-B1	0.000017	0.001	1.68%	YES	1.64%
23	2,5-Dimethylfuran	6	8766-C1	0.000012	0.001	1.19%	YES	1.64%
23	2,5-Dimethylfuran	8	8766-01	0.000018	0.001	1.87%	YES	1.64%
23	2,5-Dimethylfuran	10	8766-E1	0.000018	0.001	1.87%	YES	1.64%
23	2,5-Dimethylfuran	12	8766-F1	0.000018	0.001	1.84%	YES	1.64%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBL (ppm)	Fraction of DBL	Measurement + DBL (BLP)	Approx. DBL (BL)
23	2,5-Dimethylfuran	14	8766-G1	0.000018	0.001	1.84%	YES	1.84%
23	2,5-Dimethylfuran	16	8766-H1	0.000011	0.001	1.12%	YES	1.84%
23	2,5-Dimethylfuran	2	8766-A1	0.000011	0.001	1.08%	YES	1.84%
23	2,5-Dimethylfuran	4	8766-B1	0.000012	0.001	1.20%	YES	1.84%
23	2,5-Dimethylfuran	6	8766-C1	0.000018	0.001	1.81%	YES	1.84%
23	2,5-Dimethylfuran	8	8766-D1	0.000012	0.001	1.20%	YES	1.84%
23	2,5-Dimethylfuran	10	8766-E1	0.000012	0.001	1.23%	YES	1.84%
23	2,5-Dimethylfuran	12						1.84%
23	2,5-Dimethylfuran	14	8766-G1	0.000011	0.001	1.12%	YES	1.84%
23	2,5-Dimethylfuran	16	8766-H1	0.000018	0.001	1.84%	YES	1.84%
27	2-Furylfuran	2	8765-A1	0.000013	0.001	1.34%	YES	1.43%
27	2-Furylfuran	4	8765-B1	0.000031	0.001	3.11%		1.43%
27	2-Furylfuran	6	8765-C1	0.000013	0.001	1.30%	YES	1.43%
27	2-Furylfuran	8	8765-D1	0.000013	0.001	1.35%	YES	1.43%
27	2-Furylfuran	10	8765-E1	0.000014	0.001	1.36%	YES	1.43%
27	2-Furylfuran	12	8765-F1	0.000031	0.001	3.11%		1.43%
27	2-Furylfuran	14	8765-G1	0.000013	0.001	1.34%	YES	1.43%
27	2-Furylfuran	16	8765-H1	0.000013	0.001	1.35%	YES	1.43%
27	2-Furylfuran	2	8765-A1	0.000009	0.001	0.88%	YES	1.43%
27	2-Furylfuran	4	8765-B1	0.000009	0.001	0.85%	YES	1.43%
27	2-Furylfuran	6	8765-C1	0.000009	0.001	0.85%	YES	1.43%
27	2-Furylfuran	8	8765-D1	0.000009	0.001	0.86%	YES	1.43%
27	2-Furylfuran	10	8765-E1	0.000009	0.001	0.87%	YES	1.43%
27	2-Furylfuran	12	8765-F1	0.000009	0.001	0.89%	YES	1.43%
27	2-Furylfuran	14	8765-G1	0.000009	0.001	0.87%	YES	1.43%
27	2-Furylfuran	16	8765-H1	0.000009	0.001	0.90%	YES	1.43%
27	2-Furylfuran	2	8766-A1	0.000013	0.001	1.28%	YES	1.43%
27	2-Furylfuran	4	8766-B1	0.000013	0.001	1.30%	YES	1.43%
27	2-Furylfuran	6	8766-C1	0.000009	0.001	0.92%	YES	1.43%
27	2-Furylfuran	8	8766-D1	0.000014	0.001	1.41%	YES	1.43%
27	2-Furylfuran	10	8766-E1	0.000014	0.001	1.41%	YES	1.43%
27	2-Furylfuran	12	8766-F1	0.000014	0.001	1.42%	YES	1.43%
27	2-Furylfuran	14	8766-G1	0.000014	0.001	1.43%	YES	1.43%
27	2-Furylfuran	16	8766-H1	0.000009	0.001	0.87%	YES	1.43%
27	2-Furylfuran	2	8766-A1	0.000020	0.001	1.97%		1.43%
27	2-Furylfuran	4	8766-B1	0.000009	0.001	0.93%	YES	1.43%
27	2-Furylfuran	6	8766-C1	0.000014	0.001	1.40%	YES	1.43%
27	2-Furylfuran	8	8766-D1	0.000009	0.001	0.93%	YES	1.43%
27	2-Furylfuran	10	8766-E1	0.000010	0.001	0.95%	YES	1.43%
27	2-Furylfuran	12						1.43%
27	2-Furylfuran	14	8766-G1	0.000009	0.001	0.87%	YES	1.43%
27	2-Furylfuran	16	8766-H1	0.000014	0.001	1.43%	YES	1.43%
28	3-Heptylfuran	2	8765-A1	0.000015	0.001	1.46%	YES	1.56%
28	3-Heptylfuran	4	8765-B1	0.000014	0.001	1.42%	YES	1.56%
28	3-Heptylfuran	6	8765-C1	0.000014	0.001	1.42%	YES	1.56%
28	3-Heptylfuran	8	8765-D1	0.000015	0.001	1.47%	YES	1.56%
28	3-Heptylfuran	10	8765-E1	0.000015	0.001	1.49%	YES	1.56%
28	3-Heptylfuran	12	8765-F1	0.000015	0.001	1.49%	YES	1.56%
28	3-Heptylfuran	14	8765-G1	0.000015	0.001	1.46%	YES	1.56%
28	3-Heptylfuran	16	8765-H1	0.000015	0.001	1.47%	YES	1.56%
28	3-Heptylfuran	2	8765-A1	0.000010	0.001	0.96%	YES	1.56%
28	3-Heptylfuran	4	8765-B1	0.000009	0.001	0.93%	YES	1.56%
28	3-Heptylfuran	6	8765-C1	0.000009	0.001	0.89%	YES	1.56%
28	3-Heptylfuran	8	8765-D1	0.000009	0.001	0.93%	YES	1.56%
28	3-Heptylfuran	10	8765-E1	0.000009	0.001	0.94%	YES	1.56%
28	3-Heptylfuran	12	8765-F1	0.000010	0.001	0.97%	YES	1.56%
28	3-Heptylfuran	14	8765-G1	0.000010	0.001	0.95%	YES	1.56%
28	3-Heptylfuran	16	8765-H1	0.000010	0.001	0.98%	YES	1.56%
28	2-Heptylfuran	2	8766-A1	0.000014	0.001	1.39%	YES	1.56%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEI (ppm)	Fraction of OEI	Measurement < C ₁ (R ₁)	Approx. OEI (R ₁)
28	2-Heptylfuran	4	8766-B1	0.000014	0.001	1.42%	YES	1.56%
28	2-Heptylfuran	6	8766-C1	0.000010	0.001	1.00%	YES	1.56%
28	2-Heptylfuran	8	8766-D1	0.000015	0.001	1.54%	YES	1.56%
28	2-Heptylfuran	10	8766-E1	0.000015	0.001	1.54%	YES	1.56%
28	2-Heptylfuran	12	8766-F1	0.000016	0.001	1.55%	YES	1.56%
28	2-Heptylfuran	14	8766-G1	0.000016	0.001	1.56%	YES	1.56%
28	2-Heptylfuran	16	8766-H1	0.000008	0.001	0.80%	YES	1.56%
28	2-Heptylfuran	2	8766-A2	0.000015	0.001	1.51%		1.56%
28	2-Heptylfuran	4	8766-B2	0.000010	0.001	1.01%	YES	1.56%
28	2-Heptylfuran	6	8766-C2	0.000015	0.001	1.51%	YES	1.56%
28	2-Heptylfuran	8	8766-D2	0.000010	0.001	1.01%	YES	1.56%
28	2-Heptylfuran	10	8766-E2	0.000010	0.001	1.04%	YES	1.56%
28	2-Heptylfuran	12						1.56%
28	2-Heptylfuran	14	8766-G2	0.000009	0.001	0.95%	YES	1.56%
28	2-Heptylfuran	16	8766-H2	0.000016	0.001	1.56%	YES	1.56%
29	2-Propylfuran	2	8765-A1	0.000012	0.001	1.21%	YES	1.50%
29	2-Propylfuran	4	8765-B1	0.000012	0.001	1.19%	YES	1.50%
29	2-Propylfuran	6	8765-C1	0.000012	0.001	1.19%	YES	1.50%
29	2-Propylfuran	8	8765-D1	0.000012	0.001	1.22%	YES	1.50%
29	2-Propylfuran	10	8765-E1	0.000012	0.001	1.24%	YES	1.50%
29	2-Propylfuran	12	8765-F1	0.000012	0.001	1.24%	YES	1.50%
29	2-Propylfuran	14	8765-G1	0.000012	0.001	1.22%	YES	1.50%
29	2-Propylfuran	16	8765-H1	0.000012	0.001	1.22%	YES	1.50%
29	2-Propylfuran	2	8765-A2	0.000008	0.001	0.80%	YES	1.50%
29	2-Propylfuran	4	8765-B2	0.000008	0.001	0.77%	YES	1.50%
29	2-Propylfuran	6	8765-C2	0.000008	0.001	0.77%	YES	1.50%
29	2-Propylfuran	8	8765-D2	0.000008	0.001	0.78%	YES	1.50%
29	2-Propylfuran	10	8765-E2	0.000008	0.001	0.79%	YES	1.50%
29	2-Propylfuran	12	8765-F2	0.000008	0.001	0.81%	YES	1.50%
29	2-Propylfuran	14	8765-G2	0.000008	0.001	0.79%	YES	1.50%
29	2-Propylfuran	16	8765-H2	0.000008	0.001	0.82%	YES	1.50%
29	2-Propylfuran	2	8766-A1	0.000012	0.001	1.26%	YES	1.50%
29	2-Propylfuran	4	8766-B1	0.000012	0.001	1.18%	YES	1.50%
29	2-Propylfuran	6	8766-C1	0.000008	0.001	0.84%	YES	1.50%
29	2-Propylfuran	8	8766-D1	0.000013	0.001	1.28%	YES	1.50%
29	2-Propylfuran	10	8766-E1	0.000013	0.001	1.28%	YES	1.50%
29	2-Propylfuran	12	8766-F1	0.000013	0.001	1.29%	YES	1.50%
29	2-Propylfuran	14	8766-G1	0.000013	0.001	1.30%	YES	1.50%
29	2-Propylfuran	16	8766-H1	0.000008	0.001	0.79%	YES	1.50%
29	2-Propylfuran	2	8766-A2	0.000008	0.001	0.76%	YES	1.50%
29	2-Propylfuran	4	8766-B2	0.000008	0.001	0.84%	YES	1.50%
29	2-Propylfuran	6	8766-C2	0.000013	0.001	1.27%	YES	1.50%
29	2-Propylfuran	8	8766-D2	0.000008	0.001	0.85%	YES	1.50%
29	2-Propylfuran	10	8766-E2	0.000009	0.001	0.86%	YES	1.50%
29	2-Propylfuran	12						1.50%
29	2-Propylfuran	14	8766-G2	0.000008	0.001	0.79%	YES	1.50%
29	2-Propylfuran	16	8766-H2	0.000012	0.001	1.30%	YES	1.50%
33	Diethylphthalate	2	8765-A1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	4	8765-B1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	6	8765-C1	0.00048	0.550148173	0.126%	YES	0.27%
33	Diethylphthalate	8	8765-D1	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	10	8765-E1	0.00020	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	12	8765-F1	0.00020	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	14	8765-G1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	16	8765-H1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	2	8765-A2	0.00020	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	4	8765-B2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	6	8765-C2	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	8	8765-D2	0.00020	0.550148173	0.037%	YES	0.27%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	Oil (ppm)	Fraction of Oil	Measurement + Oil (ppm)	Approx. Oil (%)
33	Diethylphthalate	10	8765-E2	0.00045	0.550148173	0.082%	YES	0.27%
33	Diethylphthalate	12	8765-F2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	14	8765-G2	0.00146	0.550148173	0.265%	YES	0.27%
33	Diethylphthalate	16	8765-H2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	2	8766-A1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	4	8766-B1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	6	8766-C1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	8	8766-D0	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	10	8766-E1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	12	8766-F1	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	14						0.27%
33	Diethylphthalate	16	8766-H3	0.00020	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	2	8766-A2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	4	8766-B2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	6	8766-C2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	8						0.27%
33	Diethylphthalate	10	8766-E2	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	12	8766-F2	0.00020	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	14	8766-G2	0.00019	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	16	8766-H2	0.00019	0.550148173	0.034%	YES	0.27%
34	Acetonitrile	2	8765-A1	0.0056	20	0.018%		0.0013%
34	Acetonitrile	4	8765-B1	0.0050	20	0.016%		0.0013%
34	Acetonitrile	6	8765-C1	0.0049	20	0.015%		0.0013%
34	Acetonitrile	8	8765-D0	0.0047	20	0.013%		0.0013%
34	Acetonitrile	10	8765-E1	0.0032	20	0.010%		0.0013%
34	Acetonitrile	12	8765-F1	0.0046	20	0.013%		0.0013%
34	Acetonitrile	14	8765-G1	0.0090	20	0.145%		0.0013%
34	Acetonitrile	16	8765-H3	0.0044	20	0.012%		0.0013%
34	Acetonitrile	2	8766-A2	0.1660	20	0.830%		0.0013%
34	Acetonitrile	4	8766-B2	0.0026	20	0.013%		0.0013%
34	Acetonitrile	6	8766-C2	0.0021	20	0.010%		0.0013%
34	Acetonitrile	8	8766-D0	0.0014	20	0.007%		0.0013%
34	Acetonitrile	10	8766-E2	0.0015	20	0.007%		0.0013%
34	Acetonitrile	12	8766-F2	0.0832	20	0.416%		0.0013%
34	Acetonitrile	14	8766-G2	0.0019	20	0.009%		0.0013%
34	Acetonitrile	16	8766-H2	0.0041	20	0.020%		0.0013%
34	Acetonitrile	2	8766-A1	0.0039	20	0.012%		0.0013%
34	Acetonitrile	4	8766-B1	0.2452	20	1.23%		0.0013%
34	Acetonitrile	6	8766-C1	0.0029	20	0.013%		0.0013%
34	Acetonitrile	8	8766-D0	0.0459	20	0.230%		0.0013%
34	Acetonitrile	10	8766-E1	0.0238	20	0.119%		0.0013%
34	Acetonitrile	12	8766-F1	0.0052	20	0.026%		0.0013%
34	Acetonitrile	14	8766-G1	0.0207	20	0.103%		0.0013%
34	Acetonitrile	16	8766-H3	0.0227	20	0.113%		0.0013%
34	Acetonitrile	2	8766-A2	1.1976	20	1.99%		0.0013%
34	Acetonitrile	4	8766-B2	0.0079	20	0.040%		0.0013%
34	Acetonitrile	6	8766-C2	0.0065	20	0.033%		0.0013%
34	Acetonitrile	8	8766-D0	0.0095	20	0.048%		0.0013%
34	Acetonitrile	10	8766-E2	0.0341	20	0.070%		0.0013%
34	Acetonitrile	12	8766-F2	0.0208	20	0.100%		0.0013%
34	Acetonitrile	14	8766-G2	0.0348	20	0.074%		0.0013%
34	Acetonitrile	16	8766-H2	0.0080	20	0.040%		0.0013%
35	Propanenitrile	2	8765-A1	0.00024	6	0.004%		0.004%
35	Propanenitrile	4	8765-B1	0.00023	6	0.004%		0.004%
35	Propanenitrile	6	8765-C1	0.00030	6	0.005%		0.004%
35	Propanenitrile	8	8765-D0	0.00029	6	0.005%		0.004%
35	Propanenitrile	10	8765-E1	0.00022	6	0.004%		0.004%
35	Propanenitrile	12	8765-F1	0.00027	6	0.004%		0.004%
35	Propanenitrile	14	8765-G1	0.00017	6	0.003%	YES	0.004%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OH (ppm)	Fraction of OH	Measurement < C ₁ (R ₁)	Approx. OH (R ₁)
35	Propenenitrile	16	8765-H3	0.00014	6	0.004%		0.004%
35	Propenenitrile	2	8765-A2	0.00017	6	0.003%	YES	0.004%
35	Propenenitrile	4	8765-B2	0.00018	6	0.003%	YES	0.004%
35	Propenenitrile	6	8765-C2	0.00019	6	0.003%	YES	0.004%
35	Propenenitrile	8	8765-D2	0.00018	6	0.003%	YES	0.004%
35	Propenenitrile	10	8765-E2	0.00017	6	0.003%	YES	0.004%
35	Propenenitrile	12	8765-F2	0.00018	6	0.003%	YES	0.004%
35	Propenenitrile	14	8765-G2	0.00018	6	0.003%	YES	0.004%
35	Propenenitrile	16	8765-H2	0.00017	6	0.003%	YES	0.004%
35	Propenenitrile	2	8766-A1	0.00017	6	0.003%		0.004%
35	Propenenitrile	4	8766-B1	0.00017	6	0.004%		0.004%
35	Propenenitrile	6	8766-C1	0.00018	6	0.003%		0.004%
35	Propenenitrile	8	8766-D1	0.00019	6	0.003%		0.004%
35	Propenenitrile	10	8766-E1	0.00018	6	0.003%		0.004%
35	Propenenitrile	12	8766-F1	0.00018	6	0.004%		0.004%
35	Propenenitrile	14	8766-G1	0.00019	6	0.003%		0.004%
35	Propenenitrile	16	8766-H1	0.00018	6	0.003%		0.004%
35	Propenenitrile	2	8766-A2	0.00040	6	0.007%		0.004%
35	Propenenitrile	4	8766-B2	0.00013	6	0.004%	YES	0.004%
35	Propenenitrile	6	8766-C2	0.00012	6	0.004%	YES	0.004%
35	Propenenitrile	8	8766-D2	0.00011	6	0.003%	YES	0.004%
35	Propenenitrile	10	8766-E2	0.00012	6	0.004%	YES	0.004%
35	Propenenitrile	12	8766-F2	0.00013	6	0.004%	YES	0.004%
35	Propenenitrile	14	8766-G2	0.00013	6	0.004%	YES	0.004%
35	Propenenitrile	16	8766-H2	0.00019	6	0.003%	YES	0.004%
36	Butanenitrile	2	8765-A1	0.00010	6	0.002%	YES	0.003%
36	Butanenitrile	4	8765-B1	0.00014	6	0.002%		0.003%
36	Butanenitrile	6	8765-C1	0.00012	6	0.002%		0.003%
36	Butanenitrile	8	8765-D1	0.00014	6	0.002%		0.003%
36	Butanenitrile	10	8765-E1	0.00013	6	0.002%	YES	0.003%
36	Butanenitrile	12	8765-F1	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	14	8765-G1	0.00011	6	0.002%	YES	0.003%
36	Butanenitrile	16	8765-H1	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	2	8765-A2	0.00013	6	0.002%	YES	0.003%
36	Butanenitrile	4	8765-B2	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	6	8765-C2	0.00013	6	0.002%	YES	0.003%
36	Butanenitrile	8	8765-D2	0.00013	6	0.002%	YES	0.003%
36	Butanenitrile	10	8765-E2	0.00011	6	0.002%	YES	0.003%
36	Butanenitrile	12	8765-F2	0.00013	6	0.002%	YES	0.003%
36	Butanenitrile	14	8765-G2	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	16	8765-H2	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	2	8766-A1	0.00018	6	0.002%	YES	0.003%
36	Butanenitrile	4	8766-B1	0.00011	6	0.002%	YES	0.003%
36	Butanenitrile	6	8766-C1	0.00017	6	0.002%		0.003%
36	Butanenitrile	8	8766-D1	0.00012	6	0.002%	YES	0.003%
36	Butanenitrile	10	8766-E1	0.00015	6	0.002%		0.003%
36	Butanenitrile	12	8766-F1	0.00014	6	0.002%		0.003%
36	Butanenitrile	14	8766-G1	0.00013	6	0.002%		0.003%
36	Butanenitrile	16	8766-H1	0.00020	6	0.003%	YES	0.003%
36	Butanenitrile	2	8766-A2	0.00021	6	0.003%	YES	0.003%
36	Butanenitrile	4	8766-B2	0.00020	6	0.003%	YES	0.003%
36	Butanenitrile	6	8766-C2	0.00020	6	0.003%	YES	0.003%
36	Butanenitrile	8	8766-D2	0.00019	6	0.002%	YES	0.003%
36	Butanenitrile	10	8766-E2	0.00020	6	0.003%	YES	0.003%
36	Butanenitrile	12	8766-F2	0.00021	6	0.003%	YES	0.003%
36	Butanenitrile	14	8766-G2	0.00021	6	0.003%	YES	0.003%
36	Butanenitrile	16	8766-H2	0.00018	6	0.002%	YES	0.003%
37	Pentanenitrile	2	8765-A1	0.00011	6	0.002%	YES	0.002%
37	Pentanenitrile	4	8765-B1	0.00012	6	0.002%	YES	0.002%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OH (ppm)	Fraction of OH	Measurement < C ₁ (H ₂ F	Approx. OH (L
37	Pentanenitrile	6	8763-C1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	8	8763-C0	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	10	8763-E1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	12	8763-F1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	14	8763-G1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	16	8763-H1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	2	8763-A2	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	4	8763-B2	0.00014	0	0.002%	YES	0.007%
37	Pentanenitrile	6	8763-C2	0.00014	0	0.002%	YES	0.007%
37	Pentanenitrile	8	8763-D2	0.00014	0	0.002%	YES	0.007%
37	Pentanenitrile	10	8763-E2	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	12	8763-F2	0.00014	0	0.002%	YES	0.007%
37	Pentanenitrile	14	8763-G2	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	16	8763-H2	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	2	8764-A1	0.00018	0	0.003%	YES	0.007%
37	Pentanenitrile	4	8764-B1	0.00012	0	0.002%	YES	0.007%
37	Pentanenitrile	6	8764-C1	0.00043	0	0.007%	YES	0.007%
37	Pentanenitrile	8	8764-D1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	10	8764-E1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	12	8764-F1	0.00013	0	0.002%	YES	0.007%
37	Pentanenitrile	14	8764-G1	0.00014	0	0.002%	YES	0.007%
37	Pentanenitrile	16	8764-H1	0.00023	0	0.003%	YES	0.007%
37	Pentanenitrile	2	8764-A2	0.00022	0	0.004%	YES	0.007%
37	Pentanenitrile	4	8764-B2	0.00023	0	0.003%	YES	0.007%
37	Pentanenitrile	6	8764-C2	0.00021	0	0.003%	YES	0.007%
37	Pentanenitrile	8	8764-D2	0.00020	0	0.003%	YES	0.007%
37	Pentanenitrile	10	8764-E2	0.00021	0	0.003%	YES	0.007%
37	Pentanenitrile	12	8764-F2	0.00023	0	0.004%	YES	0.007%
37	Pentanenitrile	14	8764-G2	0.00022	0	0.004%	YES	0.007%
37	Pentanenitrile	16	8764-H2	0.00018	0	0.003%	YES	0.007%
38	Hexanenitrile	2	8765-A1	0.00009	0	0.002%	YES	0.003%
38	Hexanenitrile	4	8765-B1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	6	8765-C1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	8	8765-D1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	10	8765-E1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	12	8765-F1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	14	8765-G1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	16	8765-H1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	2	8765-A2	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	4	8765-B2	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	6	8765-C2	0.00012	0	0.002%	YES	0.003%
38	Hexanenitrile	8	8765-D2	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	10	8765-E2	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	12	8765-F2	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	14	8765-G2	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	16	8765-H2	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	2	8766-A1	0.00015	0	0.003%	YES	0.003%
38	Hexanenitrile	4	8766-B1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	6	8766-C1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	8	8766-D1	0.00010	0	0.002%	YES	0.003%
38	Hexanenitrile	10	8766-E1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	12	8766-F1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	14	8766-G1	0.00011	0	0.002%	YES	0.003%
38	Hexanenitrile	16	8766-H1	0.00018	0	0.003%	YES	0.003%
38	Hexanenitrile	2	8766-A2	0.00019	0	0.003%	YES	0.003%
38	Hexanenitrile	4	8766-B2	0.00018	0	0.003%	YES	0.003%
38	Hexanenitrile	6	8766-C2	0.00018	0	0.003%	YES	0.003%
38	Hexanenitrile	8	8766-D2	0.00017	0	0.003%	YES	0.003%
38	Hexanenitrile	10	8766-E2	0.00018	0	0.003%	YES	0.003%
38	Hexanenitrile	12	8766-F2	0.00019	0	0.003%	YES	0.003%
38	Hexanenitrile	14	8766-G2	0.00019	0	0.003%	YES	0.003%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DEL (ppm)	Fraction of DEL	Measurement + DEL (RL)	Approx. DEL (RL)
38	Hexamethylen	16	8765-H2	0.00016	6	0.002%	YES	0.001%
41	Ethylamine	2	8765-A1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	4	8765-B1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	6	8765-C1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	8	8765-D1	0.1467	5	2.93%		0.10%
42	Ethylamine	10	8765-E1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8765-F1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8765-G1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	16	8765-H1	0.1402	5	2.80%		0.10%
42	Ethylamine	2	8765-A2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	4	8765-B2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	6	8765-C2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	8	8765-D2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	10	8765-E2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8765-F2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8765-G2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	16	8765-H2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	2	8766-A1	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	4	8766-B1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	6	8766-C1	0.1221	5	2.44%		0.10%
42	Ethylamine	8	8766-D1	0.1375	5	2.75%		0.10%
42	Ethylamine	10	8766-E1	0.0960	5	1.92%		0.10%
42	Ethylamine	12	8766-F1	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	14	8766-G1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	16	8766-H1	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	2	8766-A2	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	4	8766-B2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	6	8766-C2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	8	8766-D2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	10	8766-E2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8766-F2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	14	8766-G2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	16	8766-H2	0.0046	5	0.09%	YES	0.10%
43	N-Nitrosodimethylamine	2	8765-A1	0.00834	0.0003	2843%		12.7%
43	N-Nitrosodimethylamine	4	8765-B1	0.01197	0.0003	3991%		12.7%
43	N-Nitrosodimethylamine	6	8765-C1	0.01374	0.0003	4579%		12.7%
43	N-Nitrosodimethylamine	8	8765-D1	0.01189	0.0003	3963%		12.7%
43	N-Nitrosodimethylamine	10	8765-E1	0.01377	0.0003	4589%		12.7%
43	N-Nitrosodimethylamine	12	8765-F1	0.01207	0.0003	4014%		12.7%
43	N-Nitrosodimethylamine	14	8765-G1	0.00146	0.0003	486%		12.7%
43	N-Nitrosodimethylamine	16	8765-H1	0.01099	0.0003	3642%		12.7%
43	N-Nitrosodimethylamine	2	8765-A2	0.00004	0.0003	12.4%	YES	12.7%
43	N-Nitrosodimethylamine	4	8765-B2	0.00004	0.0003	12.3%	YES	12.7%
43	N-Nitrosodimethylamine	6	8765-C2	0.00004	0.0003	12.3%	YES	12.7%
43	N-Nitrosodimethylamine	8	8765-D2	0.00004	0.0003	12.7%	YES	12.7%
43	N-Nitrosodimethylamine	10	8765-E2	0.00004	0.0003	12.7%	YES	12.7%
43	N-Nitrosodimethylamine	12	8765-F2	0.00004	0.0003	12.6%	YES	12.7%
43	N-Nitrosodimethylamine	14	8765-G2	0.00004	0.0003	12.3%	YES	12.7%
43	N-Nitrosodimethylamine	16	8765-H2	0.00004	0.0003	12.4%	YES	12.7%
43	N-Nitrosodimethylamine	2	8766-A1	0.00833	0.0003	2776%		12.7%
43	N-Nitrosodimethylamine	4	8766-B1	0.01084	0.0003	3613%		12.7%
43	N-Nitrosodimethylamine	6	8766-C1	0.01346	0.0003	4488%		12.7%
43	N-Nitrosodimethylamine	8	8766-D1	0.01087	0.0003	3624%		12.7%
43	N-Nitrosodimethylamine	10	8766-E1	0.00834	0.0003	2776%		12.7%
43	N-Nitrosodimethylamine	12	8766-F1	0.00839	0.0003	2863%		12.7%
43	N-Nitrosodimethylamine	14	8766-G1	0.00964	0.0003	3114%		12.7%
43	N-Nitrosodimethylamine	16	8766-H1	0.00628	0.0003	2093%		12.7%
43	N-Nitrosodimethylamine	2	8766-A2	0.00003	0.0003	6.17%	YES	12.7%
43	N-Nitrosodimethylamine	4	8766-B2	0.00002	0.0003	6.11%	YES	12.7%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBL (ppm)	Fraction of DBL	Measurement + DBL (BLP)	Approx. DBL (BL)
43	N-Nitrosodimethylamine	6	8766-C2	0.00002	0.0003	6.29%	YES	12.7%
43	N-Nitrosodimethylamine	8	8766-C2	0.00002	0.0003	6.29%	YES	12.7%
43	N-Nitrosodimethylamine	10	8766-E2	0.00002	0.0003	6.29%	YES	12.7%
43	N-Nitrosodimethylamine	12	8766-F2	0.00002	0.0003	6.21%	YES	12.7%
43	N-Nitrosodimethylamine	14	8766-G2	0.00002	0.0003	6.18%	YES	12.7%
43	N-Nitrosodimethylamine	16	8766-H2	0.00002	0.0003	7.95%	YES	12.7%
44	N-Nitrosodimethylamine	2	8765-A1	0.00004	0.0001	42.9%		25.7%
44	N-Nitrosodimethylamine	4	8765-B1	0.00006	0.0001	58.5%		25.7%
44	N-Nitrosodimethylamine	6	8765-C1	0.00009	0.0001	54.5%		25.7%
44	N-Nitrosodimethylamine	8	8765-D1	0.00002	0.0001	24.5%	YES	25.7%
44	N-Nitrosodimethylamine	10	8765-E1	0.00002	0.0001	24.4%	YES	25.7%
44	N-Nitrosodimethylamine	12	8765-F1	0.00002	0.0001	24.2%	YES	25.7%
44	N-Nitrosodimethylamine	14	8765-G1	0.00002	0.0001	23.9%	YES	25.7%
44	N-Nitrosodimethylamine	16	8765-H1	0.00002	0.0001	24.0%	YES	25.7%
44	N-Nitrosodimethylamine	2	8765-A2	0.00002	0.0001	24.8%	YES	25.7%
44	N-Nitrosodimethylamine	4	8765-B2	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodimethylamine	6	8765-C2	0.00003	0.0001	25.1%	YES	25.7%
44	N-Nitrosodimethylamine	8	8765-D2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodimethylamine	10	8765-E2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodimethylamine	12	8765-F2	0.00003	0.0001	25.2%	YES	25.7%
44	N-Nitrosodimethylamine	14	8765-G2	0.00002	0.0001	24.6%	YES	25.7%
44	N-Nitrosodimethylamine	16	8765-H2	0.00002	0.0001	24.8%	YES	25.7%
44	N-Nitrosodimethylamine	2	8766-A1	0.00007	0.0001	68.4%		25.7%
44	N-Nitrosodimethylamine	4	8766-B1	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodimethylamine	6	8766-C1	0.00007	0.0001	70.8%		25.7%
44	N-Nitrosodimethylamine	8	8766-D1	0.00009	0.0001	25.1%	YES	25.7%
44	N-Nitrosodimethylamine	10	8766-E1	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodimethylamine	12	8766-F1	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodimethylamine	14	8766-G1	0.00002	0.0001	24.7%	YES	25.7%
44	N-Nitrosodimethylamine	16	8766-H1	0.00002	0.0001	24.6%	YES	25.7%
44	N-Nitrosodimethylamine	2	8766-A2	0.00003	0.0001	25.7%	YES	25.7%
44	N-Nitrosodimethylamine	4	8766-B2	0.00003	0.0001	25.5%	YES	25.7%
44	N-Nitrosodimethylamine	6	8766-C2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodimethylamine	8	8766-D2	0.00003	0.0001	25.5%	YES	25.7%
44	N-Nitrosodimethylamine	10	8766-E2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodimethylamine	12	8766-F2	0.00003	0.0001	25.2%	YES	25.7%
44	N-Nitrosodimethylamine	14	8766-G2	0.00003	0.0001	25.1%	YES	25.7%
44	N-Nitrosodimethylamine	16	8766-H2	0.00002	0.0001	24.4%	YES	25.7%
45	N-Nitrosomethylethylamine	2	8765-A1	0.00012	0.0003	74.4%		9.93%
45	N-Nitrosomethylethylamine	4	8765-B1	0.00030	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	6	8765-C1	0.00027	0.0003	93.1%		9.93%
45	N-Nitrosomethylethylamine	8	8765-D1	0.00013	0.0003	83.8%		9.93%
45	N-Nitrosomethylethylamine	10	8765-E1	0.00010	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	12	8765-F1	0.00030	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	14	8765-G1	0.00004	0.0003	12.1%		9.93%
45	N-Nitrosomethylethylamine	16	8765-H1	0.00014	0.0003	80.5%		9.93%
45	N-Nitrosomethylethylamine	2	8765-A2	0.00003	0.0003	9.57%	YES	9.93%
45	N-Nitrosomethylethylamine	4	8765-B2	0.00003	0.0003	9.63%	YES	9.93%
45	N-Nitrosomethylethylamine	6	8765-C2	0.00003	0.0003	9.70%	YES	9.93%
45	N-Nitrosomethylethylamine	8	8765-D2	0.00003	0.0003	9.80%	YES	9.93%
45	N-Nitrosomethylethylamine	10	8765-E2	0.00003	0.0003	9.81%	YES	9.93%
45	N-Nitrosomethylethylamine	12	8765-F2	0.00003	0.0003	9.75%	YES	9.93%
45	N-Nitrosomethylethylamine	14	8765-G2	0.00003	0.0003	9.51%	YES	9.93%
45	N-Nitrosomethylethylamine	16	8765-H2	0.00003	0.0003	9.57%	YES	9.93%
45	N-Nitrosomethylethylamine	2	8766-A1	0.00018	0.0003	61.2%		9.93%
45	N-Nitrosomethylethylamine	4	8766-B1	0.00030	0.0003	98.7%		9.93%
45	N-Nitrosomethylethylamine	6	8766-C1	0.00032	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	8	8766-D1	0.00017	0.0003	90.0%		9.93%
45	N-Nitrosomethylethylamine	10	8766-E1	0.00021	0.0003	68.8%		9.93%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	DBL (ppm)	Fraction of DBL	Measurement < DBL	Approx. DBL
45	N-Nitrosomethylethylamine	2	8766-F1	0.00023	0.0003	73.3%		9.93%
45	N-Nitrosomethylethylamine	4	8766-G1	0.00023	0.0003	73.4%		9.93%
45	N-Nitrosomethylethylamine	6	8766-H1	0.00023	0.0003	73.2%		9.93%
45	N-Nitrosomethylethylamine	8	8766-A2	0.00009	0.0003	9.93%	YES	9.93%
45	N-Nitrosomethylethylamine	4	8766-B2	0.00003	0.0003	3.68%	YES	9.93%
45	N-Nitrosomethylethylamine	6	8766-C2	0.00009	0.0003	9.83%	YES	9.93%
45	N-Nitrosomethylethylamine	8	8766-D2	0.00003	0.0003	3.68%	YES	9.93%
45	N-Nitrosomethylethylamine	10	8766-E2	0.00003	0.0003	9.81%	YES	9.93%
45	N-Nitrosomethylethylamine	12	8766-F2	0.00003	0.0003	9.74%	YES	9.93%
45	N-Nitrosomethylethylamine	14	8766-G2	0.00009	0.0003	9.71%	YES	9.93%
45	N-Nitrosomethylethylamine	16	8766-H2	0.00003	0.0003	9.83%	YES	9.93%
46	N-Nitrosomorpholine	2	8765-A1	0.00008	0.0006	7.98%		3.62%
46	N-Nitrosomorpholine	4	8765-B1	0.00018	0.0006	29.8%		3.62%
46	N-Nitrosomorpholine	6	8765-C1	0.00020	0.0006	32.9%		3.62%
46	N-Nitrosomorpholine	8	8765-D1	0.00018	0.0006	30.1%		3.62%
46	N-Nitrosomorpholine	10	8765-E1	0.00018	0.0006	29.8%		3.62%
46	N-Nitrosomorpholine	12	8765-F1	0.00020	0.0006	32.7%		3.62%
46	N-Nitrosomorpholine	14	8765-G1	0.00004	0.0006	7.18%		3.62%
46	N-Nitrosomorpholine	16	8765-H1	0.00007	0.0006	11.4%		3.62%
46	N-Nitrosomorpholine	2	8765-A2	0.00002	0.0006	3.47%	YES	3.62%
46	N-Nitrosomorpholine	4	8765-B2	0.00002	0.0006	3.50%	YES	3.62%
46	N-Nitrosomorpholine	6	8765-C2	0.00002	0.0006	3.52%	YES	3.62%
46	N-Nitrosomorpholine	8	8765-D2	0.00002	0.0006	3.54%	YES	3.62%
46	N-Nitrosomorpholine	10	8765-E2	0.00002	0.0006	3.56%	YES	3.62%
46	N-Nitrosomorpholine	12	8765-F2	0.00002	0.0006	3.53%	YES	3.62%
46	N-Nitrosomorpholine	14	8765-G2	0.00002	0.0006	3.43%	YES	3.62%
46	N-Nitrosomorpholine	16	8765-H2	0.00002	0.0006	3.47%	YES	3.62%
46	N-Nitrosomorpholine	2	8766-A1	0.00005	0.0006	8.94%		3.62%
46	N-Nitrosomorpholine	4	8766-B1	0.00017	0.0006	27.4%		3.62%
46	N-Nitrosomorpholine	6	8766-C1	0.00019	0.0006	31.4%		3.62%
46	N-Nitrosomorpholine	8	8766-D1	0.00014	0.0006	23.7%		3.62%
46	N-Nitrosomorpholine	10	8766-E1	0.00005	0.0006	8.07%		3.62%
46	N-Nitrosomorpholine	12	8766-F1	0.00003	0.0006	4.57%		3.62%
46	N-Nitrosomorpholine	14	8766-G1	0.00002	0.0006	3.93%		3.62%
46	N-Nitrosomorpholine	16	8766-H1	0.00002	0.0006	3.43%	YES	3.62%
46	N-Nitrosomorpholine	2	8766-A2	0.00002	0.0006	3.41%	YES	3.62%
46	N-Nitrosomorpholine	4	8766-B2	0.00002	0.0006	3.38%	YES	3.62%
46	N-Nitrosomorpholine	6	8766-C2	0.00002	0.0006	3.38%	YES	3.62%
46	N-Nitrosomorpholine	8	8766-D2	0.00002	0.0006	3.38%	YES	3.62%
46	N-Nitrosomorpholine	10	8766-E2	0.00002	0.0006	3.37%	YES	3.62%
46	N-Nitrosomorpholine	12	8766-F2	0.00002	0.0006	3.34%	YES	3.62%
46	N-Nitrosomorpholine	14	8766-G2	0.00002	0.0006	3.33%	YES	3.62%
46	N-Nitrosomorpholine	16	8766-H2	0.00002	0.0006	3.43%	YES	3.62%
47	Tributyl phosphate	2	8763-A1	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	4	8763-B1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	6	8763-C1	0.00046	0.2	0.232%	YES	0.487%
47	Tributyl phosphate	8	8763-D1	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	10	8763-E1	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	12	8763-F1	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	14	8763-G1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	16	8763-H1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	2	8763-A2	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	4	8763-B2	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	6	8763-C2	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	8	8763-D2	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	10	8763-E2	0.00010	0.2	0.130%	YES	0.487%
47	Tributyl phosphate	12	8763-F2	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	14	8763-G2	0.00097	0.2	0.487%	YES	0.487%
47	Tributyl phosphate	16	8763-H2	0.00013	0.2	0.067%	YES	0.487%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEI (ppm)	Fraction of OEI	Measurement < OEI (BLP)	Approx. OEI (BL)
47	Tributyl phosphate	2	8766-A1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	4	8766-B1	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	6	8766-C1	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	8	8766-D1	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	10	8766-E1	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	12	8766-F1	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	14						0.487%
47	Tributyl phosphate	16	8766-H1	0.00013	0.2	0.065%	YES	0.487%
47	Tributyl phosphate	2	8766-A2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	4	8766-B2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	6	8766-C2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	8						0.487%
47	Tributyl phosphate	10	8766-E2	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	12	8766-F2	0.00013	0.2	0.065%	YES	0.487%
47	Tributyl phosphate	14	8766-G2	0.00013	0.2	0.064%	YES	0.487%
47	Tributyl phosphate	16	8766-H2	0.00012	0.2	0.062%	YES	0.487%
48	Dibutyl butylphosphonate	2	8765-A1	0.00010	0.007	1.39%	YES	9.5%
48	Dibutyl butylphosphonate	4	8765-B1	0.00010	0.007	1.37%	YES	9.5%
48	Dibutyl butylphosphonate	6	8765-C1	0.00032	0.007	4.53%	YES	9.5%
48	Dibutyl butylphosphonate	8	8765-D1	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	10	8765-E1	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	12	8765-F1	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	14	8765-G1	0.00010	0.007	1.36%	YES	9.5%
48	Dibutyl butylphosphonate	16	8765-H1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	2	8765-A2	0.00009	0.007	1.31%	YES	9.5%
48	Dibutyl butylphosphonate	4	8765-B2	0.00009	0.007	1.31%	YES	9.5%
48	Dibutyl butylphosphonate	6	8765-C2	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	8	8765-D2	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	10	8765-E2	0.00021	0.007	2.99%	YES	9.5%
48	Dibutyl butylphosphonate	12	8765-F2	0.00009	0.007	1.29%	YES	9.5%
48	Dibutyl butylphosphonate	14	8765-G2	0.00067	0.007	9.52%	YES	9.5%
48	Dibutyl butylphosphonate	16	8765-H2	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	2	8766-A1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	4	8766-B1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	6	8766-C1	0.00010	0.007	1.40%	YES	9.5%
48	Dibutyl butylphosphonate	8	8766-D1	0.00009	0.007	1.32%	YES	9.5%
48	Dibutyl butylphosphonate	10	8766-E1	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	12	8766-F1	0.00009	0.007	1.32%	YES	9.5%
48	Dibutyl butylphosphonate	14						9.5%
48	Dibutyl butylphosphonate	16	8766-H1	0.00009	0.007	1.27%	YES	9.5%
48	Dibutyl butylphosphonate	2	8766-A2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	4	8766-B2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	6	8766-C2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	8						9.5%
48	Dibutyl butylphosphonate	10	8766-E2	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	12	8766-F2	0.00009	0.007	1.27%	YES	9.5%
48	Dibutyl butylphosphonate	14	8766-G2	0.00009	0.007	1.36%	YES	9.5%
48	Dibutyl butylphosphonate	16	8766-H2	0.00009	0.007	1.22%	YES	9.5%
51	Pyridine	2	8763-A1	0.00029	1	0.029%	YES	0.036%
51	Pyridine	4	8763-B1	0.00018	1	0.018%		0.036%
51	Pyridine	6	8763-C1	0.00041	1	0.041%		0.036%
51	Pyridine	8	8763-D1	0.00040	1	0.040%		0.036%
51	Pyridine	10	8763-E1	0.00033	1	0.033%	YES	0.036%
51	Pyridine	12	8763-F1	0.00033	1	0.033%		0.036%
51	Pyridine	14	8763-G1	0.00032	1	0.032%	YES	0.036%
51	Pyridine	16	8763-H1	0.00032	1	0.032%	YES	0.036%
51	Pyridine	2	8763-A2	0.00033	1	0.033%	YES	0.036%
51	Pyridine	4	8763-B2	0.00034	1	0.034%	YES	0.036%
51	Pyridine	6	8763-C2	0.00036	1	0.036%	YES	0.036%

CDPC #	Analyte	End Time (h)	Position	Conc. (ppm)	ORL (ppm)	Fraction of ORL	Measurement < ORL (MUF)	Approx. ORL (M)
51	Pyridine	8	8765-00	0.00034	0	0.034%	YES	0.034%
51	Pyridine	10	8765-02	0.00033	0	0.033%	YES	0.034%
51	Pyridine	12	8765-F3	0.00035	0	0.035%	YES	0.034%
51	Pyridine	14	8765-03	0.00033	0	0.033%	YES	0.034%
51	Pyridine	16	8765-H2	0.00032	0	0.032%	YES	0.034%
51	Pyridine	2	8766-A1	0.00034	0	0.034%		0.034%
51	Pyridine	4	8766-B1	0.00046	0	0.046%		0.046%
51	Pyridine	6	8766-C1	0.00034	0	0.034%	YES	0.034%
51	Pyridine	8	8766-01	0.00040	0	0.040%		0.040%
51	Pyridine	10	8766-E1	0.00034	0	0.034%		0.034%
51	Pyridine	12	8766-F1	0.00043	0	0.043%		0.043%
51	Pyridine	14	8766-G1	0.00036	0	0.036%		0.036%
51	Pyridine	16	8766-H1	0.00038	0	0.038%		0.038%
51	Pyridine	2	8766-A2	0.00025	0	0.025%	YES	0.025%
51	Pyridine	4	8766-B2	0.00024	0	0.024%	YES	0.024%
51	Pyridine	6	8766-C2	0.00034	0	0.034%	YES	0.034%
51	Pyridine	8	8766-02	0.00022	0	0.022%	YES	0.024%
51	Pyridine	10	8766-E2	0.00034	0	0.034%	YES	0.034%
51	Pyridine	12	8766-F2	0.00028	0	0.028%	YES	0.028%
51	Pyridine	14	8766-G2	0.00023	0	0.023%	YES	0.024%
51	Pyridine	16	8766-H2	0.00021	0	0.021%	YES	0.024%
52	2,4-Dimethylpyridine	2	8765-A1	0.00018	0.3	0.037%	YES	0.054%
52	2,4-Dimethylpyridine	4	8765-B1	0.00019	0.3	0.039%	YES	0.054%
52	2,4-Dimethylpyridine	6	8765-C1	0.00019	0.3	0.038%	YES	0.054%
52	2,4-Dimethylpyridine	8	8765-01	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	10	8765-E1	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	12	8765-F1	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	14	8765-G1	0.00020	0.3	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	16	8765-H1	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	2	8765-A2	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	4	8765-B2	0.00022	0.3	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	6	8765-C2	0.00023	0.3	0.046%	YES	0.054%
52	2,4-Dimethylpyridine	8	8765-02	0.00022	0.3	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	10	8765-E2	0.00020	0.3	0.040%	YES	0.054%
52	2,4-Dimethylpyridine	12	8765-F2	0.00022	0.3	0.045%	YES	0.054%
52	2,4-Dimethylpyridine	14	8765-G2	0.00021	0.3	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	16	8765-H2	0.00020	0.3	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	2	8766-A1	0.00022	0.3	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	4	8766-B1	0.00019	0.3	0.039%	YES	0.054%
52	2,4-Dimethylpyridine	6	8766-C1	0.00022	0.3	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	8	8766-01	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	10	8766-E1	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	12	8766-F1	0.00021	0.3	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	14	8766-G1	0.00022	0.3	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	16	8766-H1	0.00025	0.3	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	2	8766-A2	0.00026	0.3	0.052%	YES	0.054%
52	2,4-Dimethylpyridine	4	8766-B2	0.00025	0.3	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	6	8766-C2	0.00026	0.3	0.052%	YES	0.054%
52	2,4-Dimethylpyridine	8	8766-02	0.00024	0.3	0.048%	YES	0.054%
52	2,4-Dimethylpyridine	10	8766-E2	0.00028	0.3	0.057%	YES	0.054%
52	2,4-Dimethylpyridine	12	8766-F2	0.00027	0.3	0.054%	YES	0.054%
52	2,4-Dimethylpyridine	14	8766-G2	0.00027	0.3	0.054%	YES	0.054%
52	2,4-Dimethylpyridine	16	8766-H2	0.00022	0.3	0.045%	YES	0.054%

Appendix E

Plots of Other COPCs with Significant (2–10% of the OEL) Detected Values

Appendix E

Plots of Other COPCs with Significant (2–10% of the OEL) Detected Values

1,3-Butadiene (see Figure E.1) – The detection limit (DL) for 1,3-butadiene corresponds to approximately 2.2% of its OEL. All inlet and outlet concentration measurements were below the DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

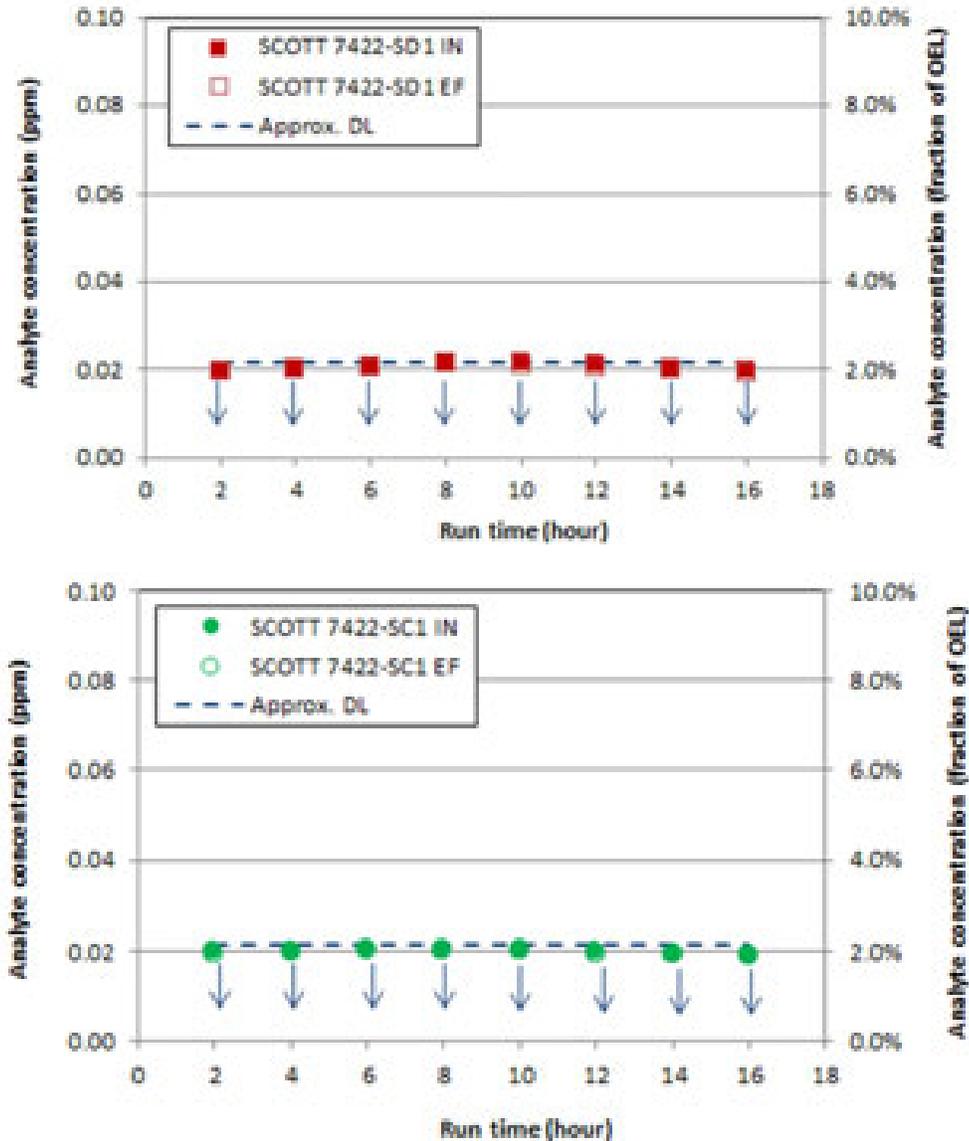


Figure E.1. Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL). Outlet data points not visible are obscured by the inlet data points.

Formaldehyde (see Figure E.2) – The DL for formaldehyde corresponds to approximately 0.6% of its OEL. All inlet and outlet values measured for both respirator cartridges were less than 10% of the OEL; specifically less than 4.4% of the OEL. The inlet concentrations for both cartridges decreased below 3% of the OEL after initial higher measurements early in each test. Outlet measurements for both cartridges were all less than or near the DL. This same trend was observed in prior tank analyses, suggesting possible environmental background interference, but this root cause still needs to be confirmed. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

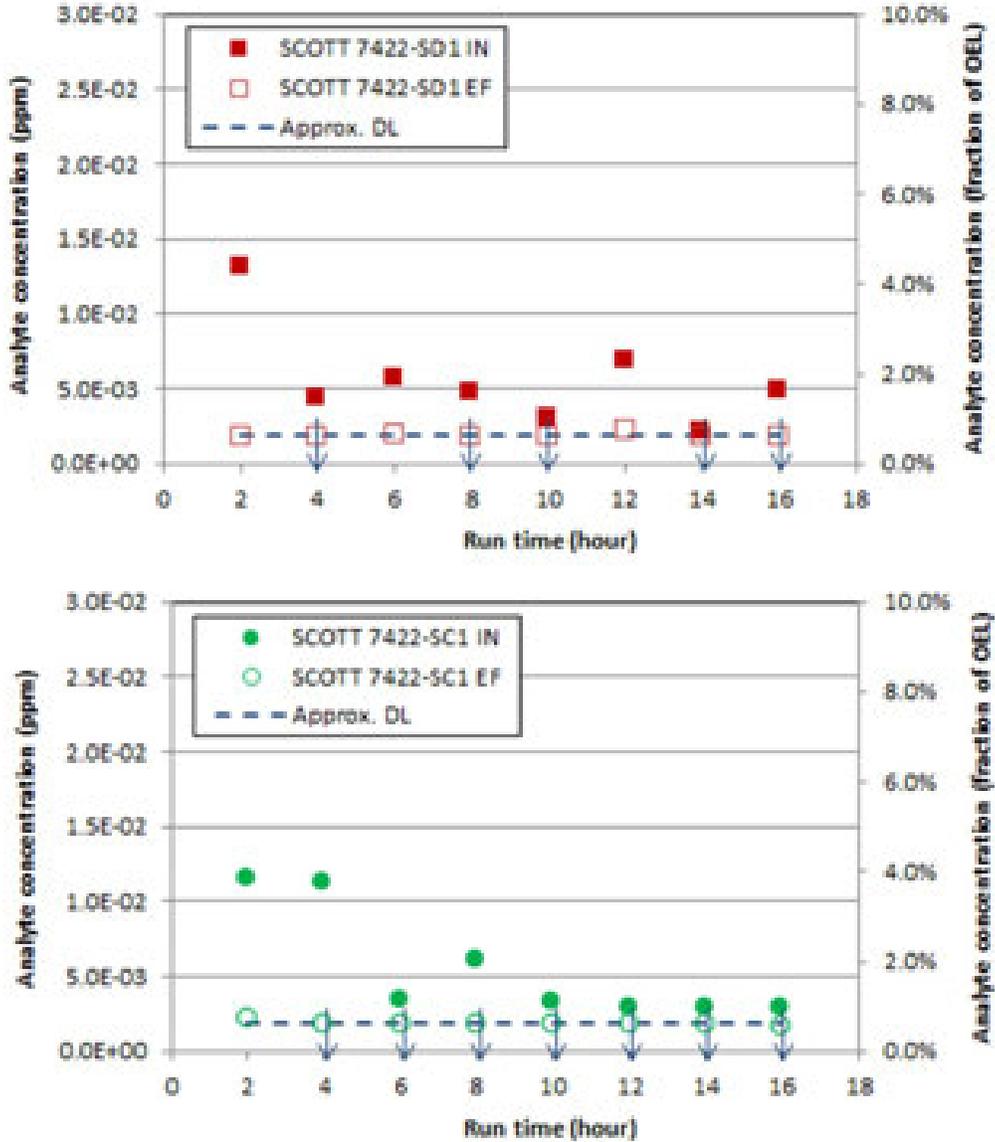


Figure E.2. Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Furan (see Figure E.3) – The DL for formaldehyde corresponds to approximately 5.8% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than the DL.¹ Inlet and outlet measurements for 6- and 16-hour sample periods for SCOTT 7422-SC1 cartridge testing indicate potential swapping or mislabeling of the sorbent tubes. This same pattern is repeated for all substituted furans, providing further evidence of a likely sample swap. Regardless, there is no evidence of breakthrough over the measured time period for either cartridge tested.

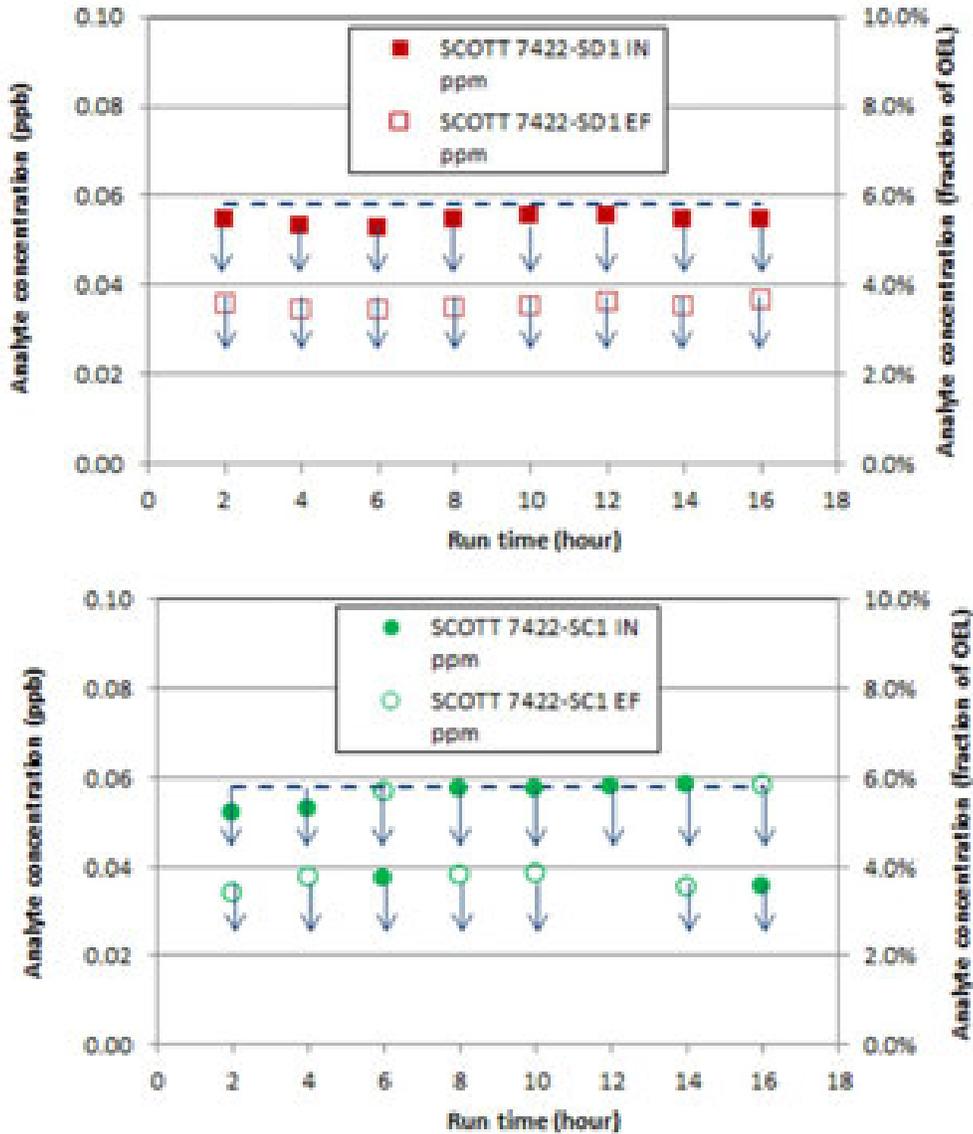


Figure E.3. Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

¹ Outlet concentration results for all furans for the 12-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

2,3-Dihydrofuran (see Figure E.4) – The DL for 2,3-dihydrofuran corresponds to approximately 3.1% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than the DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

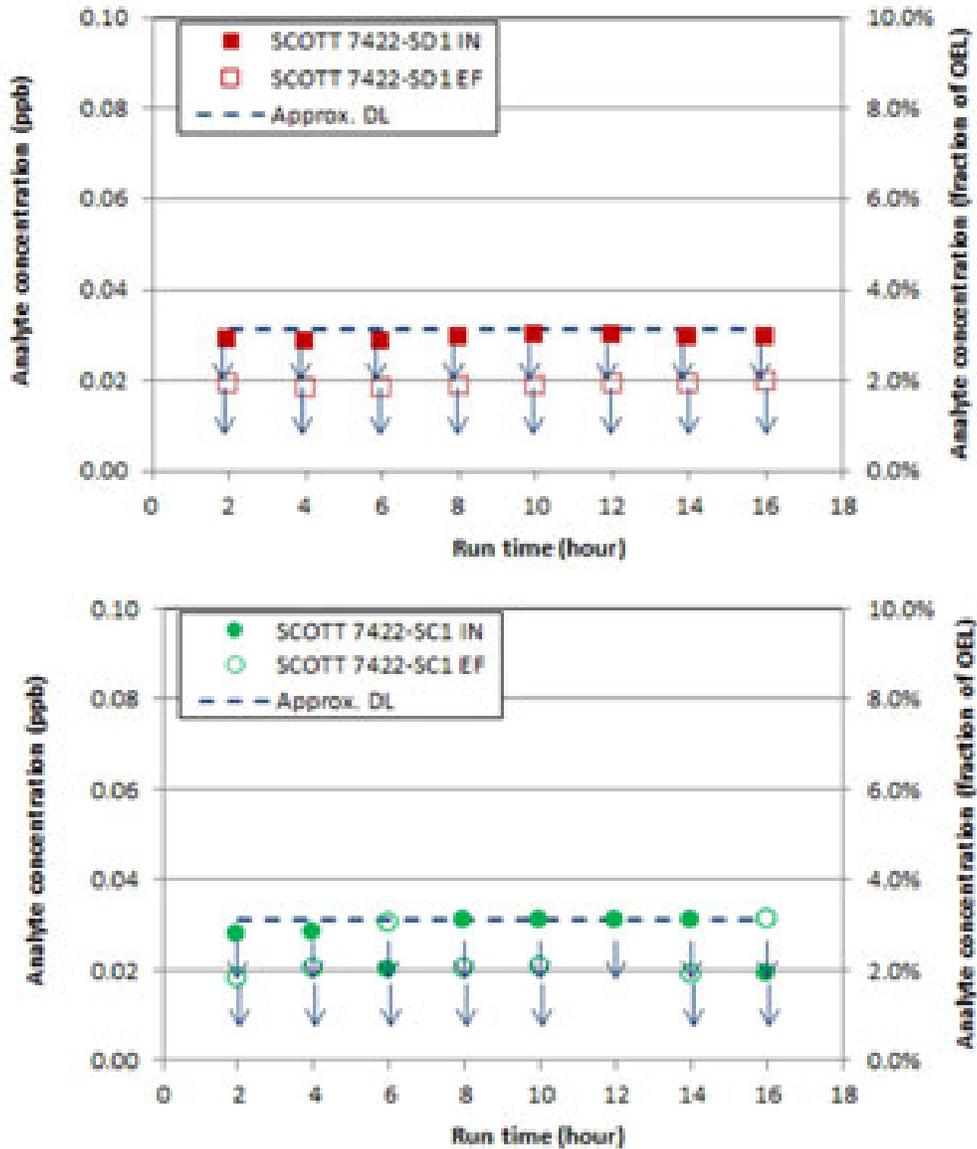


Figure E.4. Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Pentylfuran (see Figure E.5) – The DL for 2-pentylfuran corresponds to approximately 2% of its OEL. All inlet and outlet measurements were less than 3.2% of the OEL. Only a few inlet or outlet measurements were above DL, including two inlet samples at 4 and 12 hours for SCOTT 7422-SD1, and both the inlet and outlet samples at 2 hours for SCOTT 7422-SC1. All of the outlet measurements were at or near the DL, and much less than 10% of the OEL. Therefore, there is no evidence of cartridge breakthrough for 2-pentylfuran.

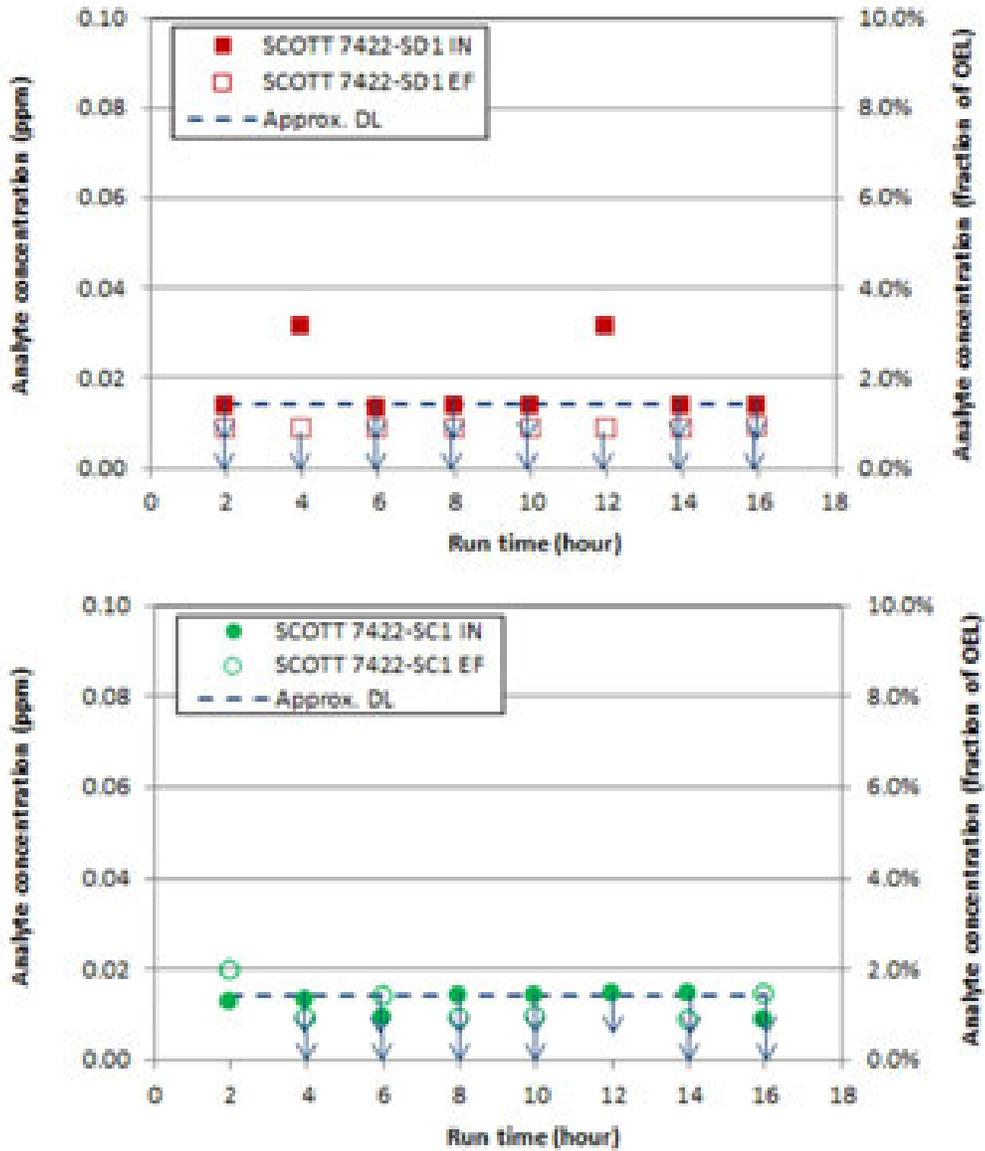


Figure E.5. Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Acetonitrile (see Figure E.6) – The DL for acetonitrile corresponds to approximately 0.001% of its OEL. All inlet concentrations measured for both respirator cartridges had measurements greater than the DL, but less than 1.3% of the OEL. All outlet values measured for both respirator cartridges were less than 1% of the OEL, with the exception of the 2-hour sample for SCOTT 7422-SC-1 cartridge that measured nearly 6% of the OEL. This data point is suspicious because it has a corresponding inlet concentration that is much lower. All inlet and outlet values are less than 10% of the OEL, therefore there is no evidence of breakthrough above 10% over the measured time period for either cartridge tested.

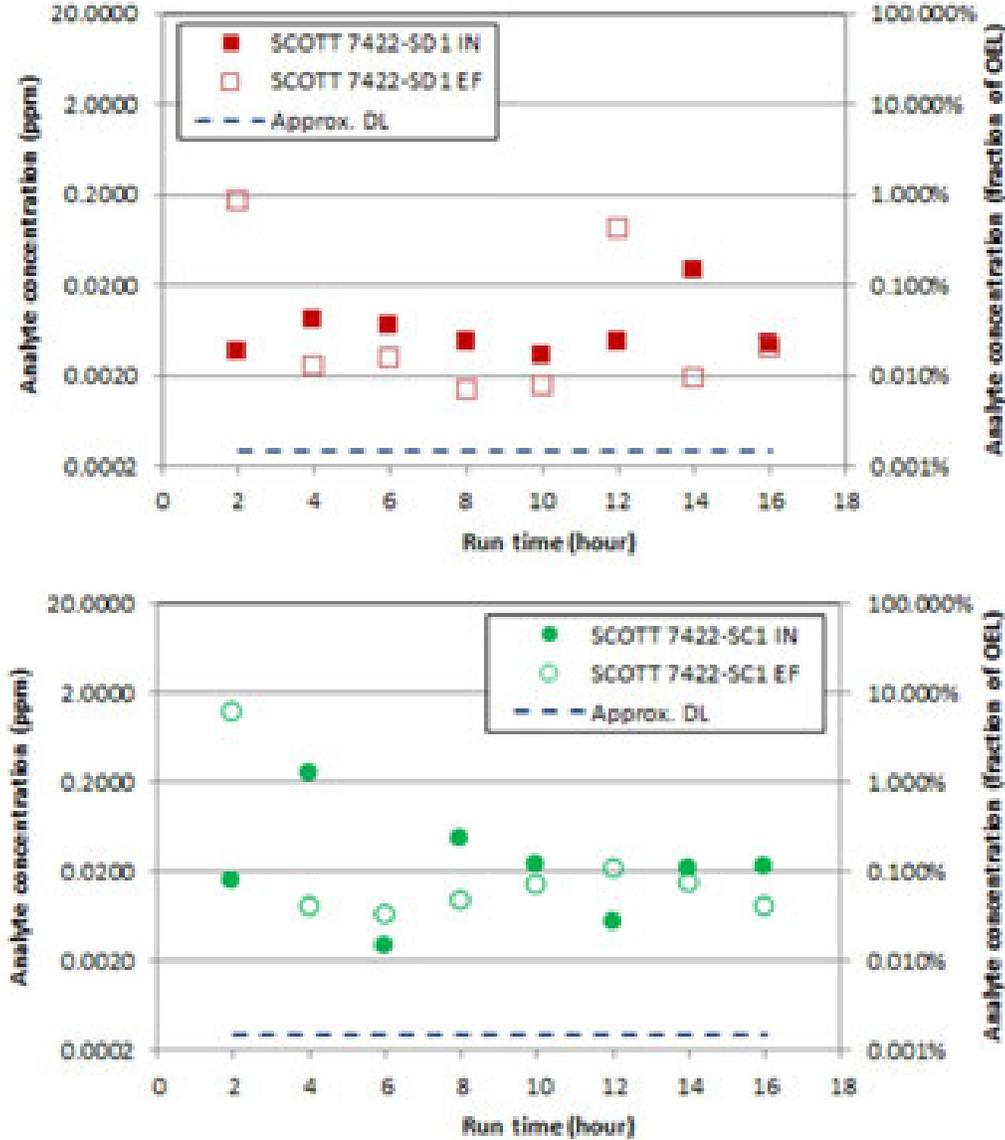


Figure E.6. Plot of Measured Acetonitrile Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Ethylamine (see Figure E.7) – The DL for ethylamine corresponds to approximately 0.1% of its OEL. Only a few inlet or outlet measurements were above DL, including two inlet samples at 8 and 16 hours for SCOTT 7422-SD1, and three inlet samples from 6 to 10 hours for SCOTT 7422-SC1. All of these inlet measurements were less than 3% of the OEL. All outlet measurements were less than DL. Therefore, there is no evidence of cartridge breakthrough.

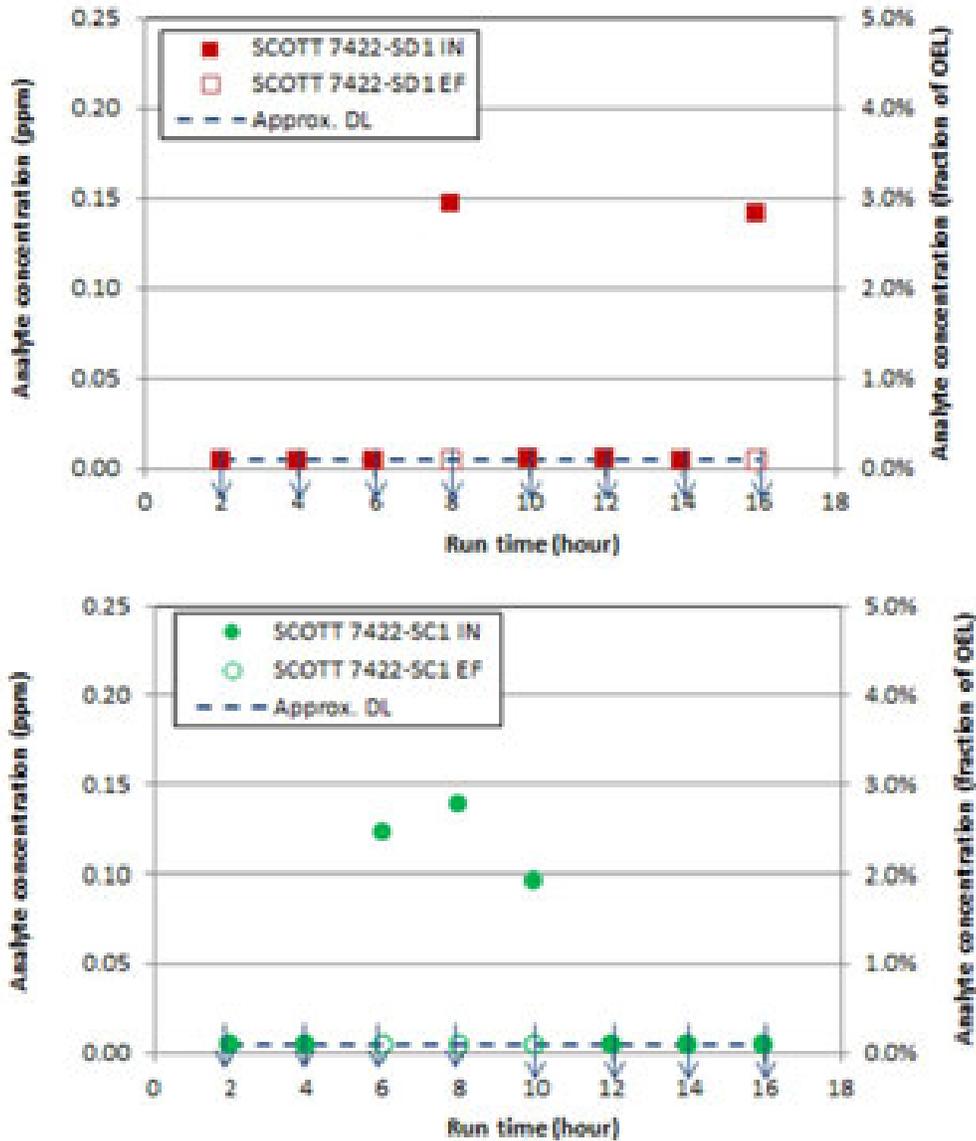


Figure E.7. Plot of Measured Ethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

Dibutyl butylphosphonate (see Figure E.8) – The detection limit for dibutyl butylphosphonate corresponds to approximately 9.5% of its OEL. The DL is driven by three samples including two outlet measurements at 10 and 14 hours, and the inlet measurement at 6 hours for SCOTT 7422-SD1 cartridge. These three samples were all less than the DL, but corresponded to concentrations greater than 3% of the OEL. Each of these samples were flagged as suspect due to low flowrates for the sorbent tube sampling. All other inlet and outlet measurements were less than DL with corresponding concentrations less than 1.5% of the OEL. There is no evidence of cartridge breakthrough.

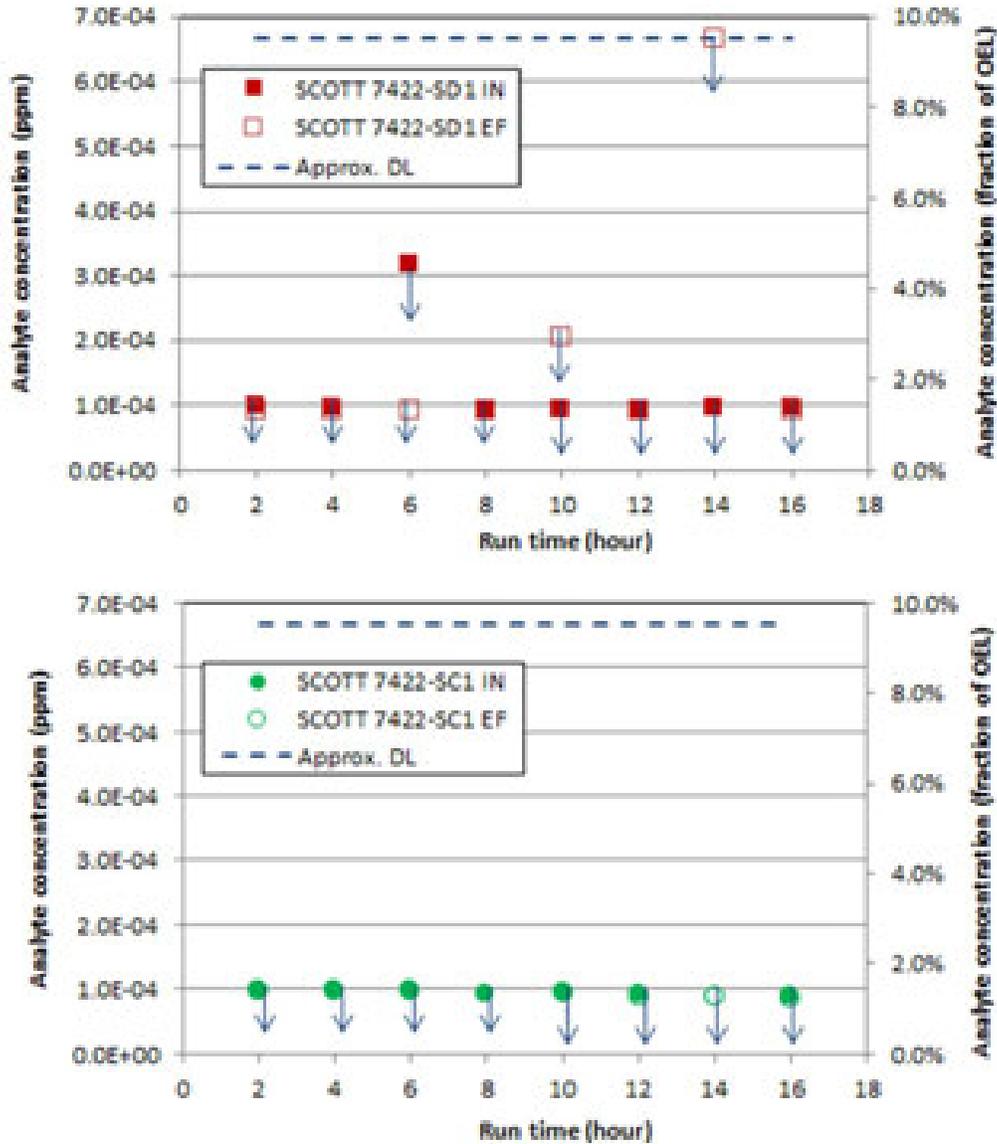


Figure E.8. Plot of Measured Dibutyl Butylphosphonate Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

Appendix F

Historical Data Comparison

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Headspace-characterization data and industrial hygiene (IH) data—hereafter referred to as “TWINS HS” and “TWINS IH”—were obtained from the Tank Characterization Database via the Tank Waste Information Network System (TWINS). All vapor analysis results for the AN exhaust were obtained via a TWINS query on June 20, 2016, for TWINS HS,⁽¹⁾ and another query on December 21, 2016, for TWINS IH. More recent headspace data were also obtained from the Site-Wide Industrial Hygiene Database (SWIHD) by a query on December 21, 2016, that obtained all headspace data that were present as of that date, producing a set referred to as “SWIHD HS.”

TWINS HS and TWINS IH data were eliminated from consideration if they were

- Quality Assurance samples (blanks, laboratory control samples, or spikes)
- Marked as suspect (Data Qualifier flag S)
- Associated with a contaminant in a blank, trip blank, or field blank (Data Qualifier flags B, T, or F)
- A laboratory control sample that was out of range (Data Qualifier flag a)
- An excessive relative percent difference (Data Qualifier flag c)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (Data Qualifier flags L or Y).

Flags a, c, and L were found only in the TWINS IH database, not in TWINS HS.

The exclusions for the SWIHD HS data set were similar:

- Having a laboratory control sample that was out of range (flag a)
- Associated with a contaminant in a blank (flags b or B)
- Having an excessive relative percent difference or relative standard deviation (flags c or d)
- Having an excessive difference between the sample result and its serial dilution (flag e)
- Having a failed mass spectrometer reading on the sample but not on its serial dilution (flag f)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (flags L or Y).

TWINS HS results associated with chemicals that were ambiguously identified (e.g., “alkane,” “unknown,” “C6 ketone”) were deleted unless the molecular weight of one of the chemicals could be unambiguously specified (e.g., “octanenitrile and others” was kept). In these mixture cases, where the Chemical ID consisted of a Chemical Abstracts Service (CAS) number followed by M, the molecular weight of the identified chemical was added to the data record, the CAS number was used for the

¹ No data have been added to TWINS HS since April 2005, so the June 2016 download does not require updating.

Chemical ID, and the concentration expressed in parts per million (absent from the downloaded database) was calculated from the concentration in milligrams per cubic meter at 25°C and the molecular weight.

A number of chemicals in the TWINS IH data set had “needs conversion” notes in the concentration (mg/m³ and ppm) columns, rather than numbers, and required calculations to supply these concentrations. The calculations made use of values already in the database: the molecular weight, the Reported Value and its units, and the Sample Volume and its units. A temperature of 25°C and a pressure of 1 atm were assumed.

The method described above was consistent with that used in PNNL-25880, except that measurements that were non-reports—less than the reporting limit (RL) for the analyte—were excluded in PNNL-25880 and were not excluded in this study.

For comparison to cartridge tests that were made using a gas stream from the AN Stack, only exhaust measurements were appropriate. The TWINS HS database contained data identified as having the location “AN Ventilation”, which were included as part of this analysis. The SWIHD HS database contained no data for the AN Stack. The TWINS IH database required sorting, as described below, so that only exhaust data were used.

The AN Farm data in the TWINS IH database that were used in analysis all had the location “Primary Exhauster” listed. Data where the location was an individual tank name, “CAM Cabinet”, or “Inside Farm” were not used. Survey titles for the “Inside Farm” location included descriptors such as “COPC” or “stack”. They may have been relevant to in-stack concentrations, but their apparent location made that unclear. Of the data with location “Primary Exhauster”, all were used except for those whose survey title included some form of the phrase “fan motor housing”. The data that were used almost all had “stack” or “train” somewhere in the survey title.

Maximum and average⁽¹⁾ exhaust concentrations were found for each analyte for the combined TWINS IH and SWIHD HS databases.⁽²⁾ These maxima and averages are given in Table F.1, together with Occupational Exposure Limits (OELs) and counts of the number of samples. The notation “n/a” is used where there were no measurements of the analyte.

Because the TWINS HS data were older, they were considered to be not as representative of the vapors present during cartridge testing and the default was to omit them from calculations. However, in some cases the maximum and average for an analyte were considerably different if they were determined from a combination of all three databases. Whenever this was the case, the results for the three-database combination are tabulated along with those for the default two-database combination. That is, Table F.1 contains two rows for the chemical instead of one, with the upper row (the default two-database combination) in normal font and the lower row (the two-database combination) in italics. The two criteria for tabulating this extra information were 1) that at least one concentration for the chemical exceeded the OEL, and 2) that there was a significant difference between the value obtained from the two-database combination and that from the three-database combination. The significant difference could be either that there were data for the three-database set but no data for the two-database set (i.e., data only in TWINS HS), or that there was a difference of a factor of three or more, in either direction, between the value obtained from the two-database combination and that from the three-database combination.

¹ Arithmetic average

² Because the SWIHD HS database contained no stack data, the TWINS IH data were the only concentrations present in the two-database combination.

Because the RLs on concentrations in the historical database were generally higher than the RLs or DLs in the cartridge tests, it was necessary to analyze data in a way that would let the effect of less than RL historical data be recognized. To do this, it was assumed that all of the non-reports in the databases had concentrations equal to the measurements' RLs. Then the following rules were applied:

1. If a maximum value was a non-report, it was marked as "<RL" in the table.
2. If all the data contributing to an average were non-reports, the average was marked as "<RL".
3. If the presence of non-reports in an average caused it to be more than a factor of two different, in either direction, from the value it would have had if only the reported concentrations were averaged, the average was marked with an asterisk ("*").

Table F.1. COPC Comparison to Historical AN Tank Farms Exhauster Measurements

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements				Measurements in this study				
					Number of Values	Maximum Value	Average Value	Minimum Value	Number of Values	Maximum Value	Average Value	Minimum Value	
Aerobials													
1 Ammonia	7664-41-7	-28	Folling et al., 2007 ²	25 ppm	37	1.94	46.4	18.6%	18.6%	1.93%	1.93%	35.0%	1.93% (RL)
2 Nitrous Oxide	30024-97-2	-127	Folling et al., 2007 ²	50 ppm	4	27.6	19.7	19.0%	19.0%	Not Measured	Not Measured	Not Measured	Not Measured
3 Mercury	7439-97-6	674	Folling et al., 2007 ²	0.035 mg/m ³	26	0.456	0.05	192.4%	260%	16.4%	16.4%	11.2%	<RL, 7.25% (RL)
Hydrocarbons													
4 1,1-Dichloroethane	108-99-0	34	Folling et al., 2007 ²	1 ppm	36	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL, 1.15% (RL)
5 Benzene	71-43-2	176	Folling et al., 2007 ²	0.5 ppm	37	<RL	<RL	<RL	<RL	0.043%	0.043%	<RL	0.027%
6 Biphenyl	93-52-4	491	Folling et al., 2007 ²	0.2 ppm	23	0.9342	0.00479 ²	2.1%	0.14% ²	<RL	<RL	<RL	<RL, 0.00%
Alcohols													
7 1-Butanol	71-36-3	243	NIOSH	20 ppm	30	1.04	0.117	15%	1.6%	0.19%	0.19%	0.14%	0.012%
8 Methanol	67-56-1	148	Folling et al., 2007 ²	200 ppm	11	<RL	<RL	<RL	<RL	Not Measured	Not Measured	Not Measured	Not Measured
Alkanes													
9 2-Hexanone	501-38-6	262	NIOSH	5 ppm	38	<RL	0.00228	<RL	0.05%	0.004%	0.004%	<RL	0.004%
10 3-Methyl-2-butene-2-one	814-38-8	208	OSHA Handbook 1999 ³	0.02 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC ⁴	Not Detected - TIC ⁴	<RL	<RL
11 4-Methyl-2-pentanone	509-41-0	282	Predicted ACD/Labs ⁵	0.5 ppm	20	<RL	<RL	<RL	<RL	0.047%	0.047%	<RL	0.012%
12 6-Methyl-3-heptanone	928-68-7	331	Predicted ACD/Labs	8 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	<RL	<RL
13 3-Butan-2-one	78-94-4	179	OSHA Handbook 1999	0.2 ppm	32	<RL	0.00178	<RL	0.89%	0.43%	0.43%	<RL	0.006%
Aldehydes													
14 Formaldehyde	50-00-0	-6	NIOSH	0.3 ppm	46	0.224	0.0358	75%	12%	4.17%	4.17%	1.85%	0.74%
15 Acetaldehyde	75-07-0	69	NIOSH	25 ppm	20	0.191	0.105	0.76%	0.42%	0.005%	0.005%	0.032%	0.005% (RL)
16 Butanal	129-27-8	167	Oxford safety data ⁶	25 ppm	13	<RL	0.02617 ⁶	<RL	0.11% ⁶	0.002%	0.002%	0.005%	0.001%
17 2-Methyl-2-butanal	1115-11-1	244	United Nations ⁷	0.03 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC
18 2-Ethylhex-3-enal	648-62-5	147	Predicted ACD/Labs	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC

Table F.1. (continued)

CAS Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements ¹				Measurements in this study				
					Number of Values	Maximum Value	Average Value	Minimum Value (NOEL)	Average Value (NOEL)	Maximum Value (NOEL)	Min. Value (NOEL)	Max. Value (NOEL)	Approx. OEL ² (NOEL)
Furans													
19	Furan	88	Poling et al., 2003	1 ppb	50	<BL	1.83	<BL	188%	<DL	<DL	<DL	5.81%
20	2,3-Dihydrofuran	130	Abu Asrar ³	1 ppb	28	0.405	0.509*	42%	17%*	<DL	<DL	<DL	3.11%
21	2,5-Dihydrofuran	152	Agicic ³	1 ppb	50	<BL	<BL	<BL	<BL	50.7%	4.84%	<DL	4.18%
22	2-Methylfuran	147	Goldfuss safety data	1 ppb	49	<BL	<BL	<BL	<BL	1.83%	1.34%	1.53%	1.23%
23	2,3-Dimethylfuran	159	Abu Asrar	1 ppb	28	<BL	<BL	<BL	<BL	<DL	<DL	<DL	1.84%
24	2-Ethyl-5-methylfuran	246	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
25	4-(2-Methylpropyl)-2,3-dihydrofuran	128	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
26	3-(2,1-Dimethyl-ethyl)-2,3-dihydrofuran	306	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
27	2-Furylfuran	133	Abu Asrar	1 ppb	28	<BL	<BL	<BL	<BL	3.11%	1.32%	1.97%	1.43%
28	2-Propylfuran	130	Abu Asrar	1 ppb	28	<BL	<BL	<BL	<BL	<DL	<DL	<DL	1.54%
29	2-Propylfuran	131	Abu Asrar	1 ppb	28	<BL	<BL	<BL	<BL	<DL	<DL	<DL	1.30%
30	2-Octylfuran	162	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
31	2-(3-Octylphenyl)propyl-2-methylfuran	405	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
32	2-(2-Methyl-6-oxocyclohexyl)furan	Not available	Not available	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
Phthalates													
33	Dihydrophthalate	943	NIOSH	5 mg/m ³	22	0.0289	0.00542	0.54%	0.11%	<DL	<DL	<DL	0.27%

Table F.1. (continued)

CAS Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Historical Measurements ^a				Measurements in this study			
						Maximum Value	Average Value	Maximum Value (NOEL)	Average Value (NOEL)	Max level (NOEL)	Exp. Inlet (NOEL)	Max outlet (NOEL)	Apptns. (NOEL)
Nitriles													
34 Acetonitrile	75-05-8	179	NIOSH	10 ppm	33	<RL	0.231*	<RL	1.2%*	1.3%	0.14%	1.99%	0.001%
35 Propionitrile	101-83-0	207	NIOSH	6 ppm	38	<RL	0.0211	<RL	0.04%	0.007%	0.004%	0.007%	0.004%
36 Butyronitrile	109-74-0	244	NIOSH	8 ppm	36	<RL	0.0246	<RL	0.04%	0.002%	<DL	<DL	0.001%
37 Pentanenitrile	110-59-8	284	MS Actar	6 ppm	38	<RL	0.0033	<RL	0.04%	0.007%	0.003%	<DL	0.007%
38 Hexanenitrile	628-73-9	328	Predicted ACD/Lab	6 ppm	38	<RL	0.002	<RL	0.03%	<DL	<DL	<DL	0.001%
39 Heptanenitrile	629-68-1	368	MS Actar	6 ppm	6	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC
40 2-Methylhexanenitrile	1847-11-4	Not available	Not available	0.3 ppm	6	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC
41 2,4-Pentanedinitrile	1615-70-9	278	Predicted ACD/Lab	0.3 ppm	6	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC
Amines													
42 Ethylamine	75-04-7	62	Poling et al., 2007	5 ppm	27	0.011	0.0842	12%	17%	2.54%	0.07%	<DL	0.096% (RL)
Nitrosamines													
43 N-nitrosodimethylamine	62-75-9	306	NIOSH	0.3 ppb	26	257	24.1	85.667%	6033%	4000%	0.00%	<DL	12.7% (RL)
44 N-nitrosodethylamine	55-18-5	351	Oxford safety data	0.1 ppb	26	<RL	<RL	<RL	<RL	79.8%	19.2%	<DL	21.7% (RL)
45 N-nitrosomethylamine	50565-95-6	310	Predicted ACD/Lab	0.3 ppb	26	0.016	0.175	185%	125%	500%	80.5%	<DL	0.93% (RL)
46 N-nitrosomorpholine	58-89-2	435	Oxford safety data	0.6 ppb	26	0.407	0.187	68%	20%	12.3%	18.4%	<DL	3.62% (RL)
Organophosphates													
47 Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	28	<RL	0.00277*	<RL	0.14%*	<DL	<DL	<DL	0.46%
48 Diethyl butylphosphonate	78-46-8	602	Predicted ACD/Lab	0.007 ppm	22	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.52%
Halogens													
49 Chlorinated biphenyls	Varies	Varies	Varies	1 mg/m ³	6	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC
50 2-Fluoropropane	1184-60-7	-11	SynQuest ²	0.1 ppm	4	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.52%

Table F.1. (continued)

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements [†]					Measurements in this study						
					Number of Values	Maximum Value	Average Value	Minimum Value	Average Value	Maximum Value	Min Inlet (NOEL)	Avg. Inlet (NOEL)	Max Inlet (NOEL)	Approx. DL [‡] (NOEL)		
Pyridines																
51	Pyridine	110-86-1	NO208	1 ppm	51	<BL	0.0514 [*]	<BL	5.19 [*]	0.046%	0.046%	<BL	0.046% (BL)			
52	2,4-Dimethylpyridine	108-47-4	ALA Resair	0.5 ppm	51	<BL	<BL	<BL	<BL	<BL	<BL	<BL	0.054% (BL)			
Organonitriles																
53	Methyl nitrite	624-91-9	Oxford safety data	0.1 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
54	Butyl nitrite	544-16-1	ALA Resair	0.1 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
Organocyanates																
55	Butyl isocyanate	928-45-0	Predicted ACD/Labs	2.5 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
56	1,4-Butanediol, dinitrate	3457-91-8	Predicted ACD/Labs	0.05 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
57	2-Nitro-2-methylpropane	594-78-7	ALA Resair	0.3 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
58	1,2,3-Propanetriol, 1,1-dinitrate	623-87-6	Predicted ACD/Labs	0.05 ppm	0	n/a	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC				
Isocyanates																
59	Methyl isocyanate	624-83-9	NO208	0.01 ppm	1	<BL	<BL	<BL	<BL	<BL	<BL	Not Detected - TIC				

[†] Historical data from TWMS Industrial Hygiene vapor database and JWH database; see text for units and dates of samples. Values in italics include those data plus data from the TWMS headspace database; all samples earlier than May 2006.

^{*} Indicates that the value of the average would differ by a factor of 2 or more (in either direction) if non-reports were excluded.

[‡] BL indicates that all pertinent measurements of the analyte were less than the reporting limit.

[§] n/a indicates that only the recent database (dated headspace and TWMS Industrial Hygiene) were included. Italics mean that the pre-2006 TWMS headspace data were also included.

[¶] n/d indicates no historical data was found in the database.

^{||} Peeling, B. E.; Praunitz, J. B.; O'Connell, J. P. *The Properties of Gases and Liquids*. McGraw Hill, 2007.

^{|||} NIOSH: National Institute of Occupational Safety and Health

^{||||} CRC Handbook of Chemistry and Physics, CRC Press, 1988.

^{|||||} ACD/Labs software <http://www.acdlabs.com/products/percepta-perceptrons.php>

^{||||||} Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

^{|||||||} Food and Agriculture Organization of the United Nations

^{|||||||} ALA Resair <https://www.ala.com/>

^{|||||||} <https://www.eurochem.com/>

^{|||||||} OSHA, Occupational Safety and Health Administration

^{|||||||} SynQuest: <http://synquestlabs.com/product/20330.html>

^{|||||||} TIC: Tentatively Identified Compounds that were not observed in this study using the specified analytical methods.

^{|||||||} Approximate Detection Limit (DL) is calculated using the reported detection limit for reporting limit from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.



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