

Analysis of Respirator Cartridge Performance Testing on Hanford Tank A-101

July 2020

SK Nune J Liu CJ Freeman TM Brouns LA Mahoney



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Pacific Northwest National Laboratory Richland, Washington 99352

Executive Summary

Washington River Protection Solutions (WRPS) conducted tests on two types of chemical cartridges for use in air purifying respirators (APR) to determine the period of time that the cartridges would provide adequate performance¹ for APRs used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from vapors emanating from the headspace of tank A-101 on the Hanford Site. The Occupational Safety and Health Administration (OSHA) identifies cartridge testing as a valid approach for establishing a cartridge change schedules.[3] 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 ensure 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 over a period from July 22–24, 2016, using headspace vapors from Hanford tank A-101 under static conditions² fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges, SCOTT 7422-SD1 and 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were assessed on separate days with A-101 headspace vapors. 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. Key conclusions from the assessment of the 59 COPCs in this study are described below:

- Based on measured cartridge inlet vapor concentrations from tank A-101 headspace, both ammonia and N-Nitrosodimethylamine (NDMA) exceeded their Occupational Exposure Limits (OEL).³ These measurements were generally consistent with maximum A-101 headspace measurements previously obtained for these two compounds.
- Ammonia had respirator cartridge outlet concentrations that exceeded 10% of the OEL for both cartridges tested, indicating breakthrough for each. For the SCOTT 7422-SD1 cartridge, ammonia appeared to breakthrough above 10% of its OEL after 2 hours. For the SCOTT 7422-SC1 cartridge, ammonia breakthrough appeared to occur after 8 hours.

¹ "Adequate performance" refers to being below the breakthrough criteria used in this analysis. The breakthrough criteria for this analysis is having sustained cartridge outlet concentrations above 10% of the compound's OEL. For some COPCs, an alternate threshold has been applied when necessary due to higher detection limit (DL)/reporting limit (RL) values for specific compounds. Ultimately, Industrial Hygiene professionals will use these results along with specific hazard assessments to determine service life, change schedules, and cartridge selection needed to provide the necessary performance for specific applications in Hanford Tank Farms.

² These tests were conducted under static conditions absent waste-disturbing activities in the subject tank or tank farm.

³ OELs 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, and American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs based on the best available science. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Despite respirator inlet measurements for NDMA that were in excess of its OEL, all corresponding outlet measurements, from both respirator cartridges, were below the analytical DL⁴ for the duration of the testing (i.e., 16 hours), indicating no evidence of breakthrough. The analytical DL for NDMA corresponds to ~12% of its OEL.
- The inlet vapor concentration of two additional COPCs—mercury and N-Nitrosodiethylamine—exceeded 10% of their OEL. These measurements were generally consistent with previously obtained average and maximum A-101 headspace measurements. The outlet concentrations of both COPCs were consistently less than their DLs, indicating no breakthrough of the cartridges during the testing period.
- All inlet and outlet measurements for N-Nitrosomethylethylamine (NMEA) from both respirator cartridges were below the analytical DL for the duration of the testing (i.e.,16 hours), indicating no breakthrough for either cartridge. The analytical DL for this COPC corresponds to ~11% of its OEL.
- The inlet vapor concentrations of all other measured COPCs were below 10% of the OEL. For the majority of COPCs, the inlet vapor concentrations during cartridge testing and average measurements from historical A-101 headspace sampling were generally consistent. Five additional COPCs (furan, 5 1,3-butadiene, nitrous oxide, acetonitrile, and N-Nitrosomorpholine) have been previously measured in A-101 headspace at levels above 10% of their respective OELs and above analytical RLs but did not exceed 10% of the OEL in this study.

Based on the measurements taken for this study, with the exception of ammonia, none of the COPCs indicated breakthrough behavior above 10% OEL during the 16-hour testing period. Breakthrough of ammonia for the SCOTTS 7422-SD1 and 7422-SC1 cartridges tested on A-101 headspace vapors occurred after 2 hours and 8 hours, respectively. However, variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact breakthrough time, especially if OEL thresholds are exceeded. In these circumstances, additional respirator cartridge evaluations may be necessary to determine proper respiratory protection requirements.

The Overview of 2016–2018 Testing of Air-Purifying Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters⁶ provides additional information on the use of the cartridge testing results for the first 28 cartridge tests with the manufacturers service life models.

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.

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⁴ The term "detection limit" is used here to refer either to an analytical reporting limit or a detection limit. The use of either an RL or a DL varied among analytical laboratories. An RL (equivalent to a limit of quantification) was

⁵ Inlet concentrations for furan using the Carbotrap 300 TDU results were significantly higher than documented in this report though breakthrough was not observed on either cartridge. The inlet maximum using the Volatile Organic Analyte method was 45.5% of the OEL for the 7422-SD1 cartridge. The re-evaluation of the furans using the Carbotrap 300 TDU is discussed in Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, P Humble, and MJ Minette. 2019. *Overview of 2016 Through 2018 Testing of Air-Purifying Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821 Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

⁶ Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, P Humble, and MJ Minette. 2019. *Overview of 2016 Through 2018 Testing of Air-Purifying Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821 Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.

Revision History

Revision Number	Effective Date	Description of Change
-	Effective Date	
0 1	December 2019	Initial issue This report has been revised to address external peer review comments on the Rev. 0 report and subsequent test reports from 2016 cartridge testing, and to correct data reporting errors. The principal changes included: 1. Addressing several external peer review comments including: a. Referencing the Overview of 2016 Through 2018 Testing of Air-Purifying Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters (PNNL-26821 Rev. 1),6 which provided additional information on historic COPC source concentrations and the significance of any differences between cartridge-testing results and historic maxima. b. Adding descriptive information to Appendices A, B, and C to provide additional clarity on the contents and methods applied
		 c. Clarifying terminology regarding breakthrough time vs. service life and change-out schedule. 2. A furans analytical methods review was conducted in 2018 ("Assessment of the Use of Alternate Furan Measurements for Respirator Cartridge Performance Determinations" letter report 69802-01). The assessment recommended the use of the Carbotrap 300 TDU tube analytical results for furan, 2,5-dihydrofuran, and 2-methylfuran in lieu of the TDU Tenax TA tube. All of the furan; 2,5-dihydrofuran; and 2-methylfuran results for the 2016 APR cartridge testing have been re-evaluated and documented in Appendix F of Freeman et al.; therefore, values for furan, 2,5-dihydrofuran, and 2-methylfuran have not been updated in this revision of the report. 3. Inlet concentrations for furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 results were higher than documented in this report. No breakthrough of these furan compounds was observed on either cartridge tested.

⁷ Only two SD1 influent readings for furan (20.2% and 45.5% of the OEL) were above the reporting limit/detection limit. All other influent and effluent readings for furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 TDU Volatile Organic Carbon method were below the reporting limit/detection limit..

Acronyms and Abbreviations

ALS Environmental Salt Lake City

APR Air Purifying Respirator
CAS Chemical Abstracts Service
CFR Code of Federal Regulations
COPC Chemicals Of Potential Concern

DL Detection Limit

EPA U.S. Environmental Protection Agency

IH Industrial hygieneNDEA N-NitrosodiethylamineNDMA N-Nitrosodimethylamine

NIOSH National Institute for Occupational Safety and Health

OEL Occupational Exposure Limit

OSHA Occupational Safety and Health Administration

PNNL Pacific Northwest National Laboratory

PPM Parts Per Million RL Reporting Limit

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

WHL 222S – Wastren Hanford Laboratory
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 (COPC) 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 change schedule for cartridges, based on objective information or data, to ensure that change-outs occur before the end of service life.[1-5] The primary function of the WRPS APR Cartridge Test Program is to obtain objective data to determine service life for the 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 headspace vapors from the A-101 single-shell waste tank at Hanford.

2.0 Regulatory Requirements

2.1 Background on Regulatory Requirements

OSHA Respiratory Protection Standard (29 CFR 1910.134) mandates/requires that 1) employers provide protective equipment, including respirators, to their employees to protect them against potential exposure to contaminants at or above documented Occupational Exposure Limits (OELs) and 2) 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 or self-contained breathing apparatuses (SCBA) must be used to provide additional protection. While the use of supplied air respirators or SCBAs offers more protection, a tradeoff exists, particularly for SCBAs that employ a large, heavy (approximately 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 change-out schedules.[3] These approaches are described below.

- Conduct experimental tests Gather 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 on 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 waste 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 results are obtained quickly. However, estimates provided by models are not as accurate as results obtained from testing; sometimes a model-estimated service life might be shorter than it needs to be because assumptions used during calculations were too conservative.

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 service life. The following are rules of thumb outlined in the publication:

- If the compound's boiling point is greater than 70°C and the concentration is less than 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 and location; and contaminants that undergo continuous reactions. However, some of the general drivers⁸ can help in interpreting the results obtained from experimental testing of respirator cartridges.

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⁸ The general drivers (a.k.a., rules of thumb) are applicable to certain compounds, but not to all compounds in a mixture, such as those in specific Hanford tank mixtures. However, an Industrial Hygiene professional can use these rules of thumb to support interpretation of results from both experiments and predictions.

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 A-101 headspace.[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 test 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 hoursWind: Up to 20 mph with blowing dust.

WRPS developed a testing program with the following conservative conditions to support robust cartridge service life estimates:

- The flow rate through each cartridge was set at approximately 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 or exhauster stack vapors rather than from Hanford Tank Farm atmospheric concentrations (i.e., source sampling vs. the breathing zone).
- 10% of the 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-SC1⁹ for Survey 2.[16] These cartridges were chosen because they are suitable for capturing organic vapors, acid gases, ammonia, formaldehyde, and particulates.[16]

3.1

⁹ SCOTT part numbers 7422-SC1 and 7422-SD1 are multipurpose APR respirator cartridges for use on Xcel Half-Mask and all SCOTT full facepieces with NIOSH approval for OV/AM/MA/CL/HC/SD/CD/HF/FM/HS applications. The -SD1 cartridge has the same multipurpose features as the -SC1, but also includes a P100 particulate filter. https://www.3mscott.com/download/742-series-cartridges-user-instructions-english/

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 >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 Hanford waste tank A-101 headspace was conducted from July 22–24, 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 for the detected COPCs. Appendix C also gives the average temperatures of the sample slipstream during testing, which ranged from 69 to 90°F as well as the average relative humidity measurements, which ranged from 45 to 94%. 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. The table further provides a summary of the test information. For example, if all of the measurements for a specific compound were less than detection limits (DL), ¹⁰ that compound is marked accordingly. Further, if concentrations were detected for a compound, the extent of the detection is also described. Based on the summary in Table 1, there were six COPCs with detected concentrations >10% of their corresponding OEL. These compounds were ammonia, mercury, acetonitrile, N-Nitrosodimethylamine (NDMA), N-Nitrosodiethylamine (NDEA), and N-Nitrosomethylethylamine (NMEA). All six of these COPCs are highlighted in yellow in Table 1 and assessed in more detail in Section 5.0.

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4.1

¹⁰ The term "detection limit" is used here to refer either to analytical reporting limit (RL) or DL. The use of either a reporting limit or DL varied among analytical laboratories. The reporting limit (equivalent to a limit of quantification) was used instead of a DL by several laboratories for specific COPC analyses. See Appendix C and Appendix F for additional information on the specific use of reporting limits or DLs for each COPC. Nitrosamine analysis results were quantified to a reporting limit.

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			I.	, ,		
1 Ammonia	7664-41-7	121 ppm	25 ppm	2.55%		Up to 484% of OEL for inlet values and 348% for outlets
2 Nitrous Oxide	10024-97-2	Not Measured	50 ppm			
3 Mercury	7439-97-6	8.32 ug/m3	25 ug/m3	7.38%		Up to 34% of OEL for inlet values. All outlets <dl< td=""></dl<>
Hydrocarbons				'		
4 1,3-Butadiene	106-99-0	0.024 ppm	1 ppm	2.44-2.64%		Up to 2.4% of OEL for inlet and oulet values
5 Benzene	71-43-2	0.0007 ppm	0.5 ppm	0.030%		Up to 0.13% of OEL for inlet values and 0.03% for outlets
6 Biphenyl	92-52-4	0.0006 ppm	0.2 ppm	0.290%	х	
Alcohols						
7 1-Butanol	71-36-3	0.026 ppm	20 ppm	0.004%		Up to 0.13% of OEL for inlet values and 0.004% for outlets
8 Methanol	67-56-1	Not Measured	200 ppm			
Ketones			1	· I		
9 2-Hexanone	591-78-6	0.0010 ppm	5 ppm	0.016%		Up to 0.02% of OEL for inlet values and 0.003% for outlets
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	0.033%	х	
12 6-Methyl-2-heptanone	928-68-7	Not Detected	8 ppm	TIC	х	
13 3-Buten-2-one	78-94-4	0.0013 ppm	0.2 ppm	0.093%		Up to 0.64% of OEL for inlet and outlet values
Aldehydes						
14 Formaldehyde	50-00-0	0.0157 ppm	0.3 ppm	0.607%		Up to 5.22% of OEL for inlet values and 2.08% for outlets
15 Acetaldehyde	75-07-0	0.0555 ppm	25 ppm	0.005%		Up to 0.22% of OEL for inlet values and 0.13% for outlets
16 Butanal	123-72-8	0.0019 ppm	25 ppm	0.001%		Up to 0.008% of OEL for inlet values and 0.002% for outlets
17 2-Methyl-2-butenal	1115-11-3	Not Detected	0.03 ppm	TIC	х	
18 2-Ethyl-hex-2-enal	645-62-5	Not Detected	0.1 ppm	TIC	х	

¹ Approximate DLs are calculated using the reported DLs (or RLs]) from the analytical laboratory and the average volume (from flowrate × 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 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.

³ The maximum furan measurement by using the Carbotrap 300 TDU method was 450 ppb (see Freeman et.al. [19]). Also in Freeman et. al. [19], 2,5-dihydrofuran, and 2-methylfuran maximums were both below the RL/DL.

 Table 1. (continued)

COPC Number and Name	Value		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 ³						Un to 4.040/ of OFI for inlet	
19 Furan	110-00-9	0.048 ppb	1 ppb	0.87%		Up to 4.84% of OEL for inlet values and 1.29% for outlets	
20 2,3-Dihydrofuran	1191-99-7	0.042 ppb	1 ppb	1.77%		Up to 4.23% of OEL for inlet values and 2.55% for outlets	
21 2,5-Dihydrofuran	1708-29-8	0.038 ppb	1 ppb	2.17%		Up to 3.84% of OEL for inlet and outlet values	
22 2-Methylfuran	534-22-5	0.021 ppb	1 ppb	1.93%		Up to 2.12% of OEL for inlet and oulet values	
23 2,5-Dimethylfuran	625-86-5	0.031 ppb	1 ppb	3.08%	х		
24 2-Ethyl-5-methylfuran	1703-52-2	Not Detected	1 ppb	TIC	х		
25 4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	Not Detected	1 ppb	TIC	х		
26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	Not Detected	1 ppb	TIC	х		
27 2-Pentylfuran	3777-69-3	0.027 ppb	1 ppb	1.70%		Up to 2.73% of OEL for inlet and outlet values	
28 2-Heptylfuran	3777-71-7	0.018 ppb	1 ppb	1.06%		Up to 1.82 % of OEL for inlet and outlet values	
29 2-Propylfuran	4229-91-8	0.034 ppb	1 ppb	2.75%		Up to 3.37% of OEL for inlet values. All outlets <dl< td=""></dl<>	
30 2-Octylfuran	4179-38-8	Not Detected	1 ppb	TIC	х		
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	Not Detected	1 ppb	TIC	х		
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not Detected	1 ppb	TIC	х		
Phthalates							
33 Diethylphthalate	84-66-2	0.0064 mg/m3	5 mg/m3	0.127%	x		
Nitriles			!	· · · · · · · · · · · · · · · · · · ·			
34 Acetonitrile	75-05-8	2.48 ppm	20 ppm	0.001%		12.4% of OEL for one outlet value. All other values <1.5%.	
35 Propanenitrile	107-12-0	0.0040 ppm	6 ppm	0.004%		Up to 0.07% of OEL for inlet and outlet values	
36 Butanenitrile	109-74-0	0.0034 ppm	8 ppm	m 0.003%		Up to 0.043% of OEL for inlet values. All outlets <dl< td=""></dl<>	
37 Pentanenitrile	110-59-8	0.0009 ppm	6 ppm	6 ppm 0.004%		Up to 0.015% of OEL for inlet values and 0.006% for outlets	
38 Hexanenitrile	628-73-9	0.0002 ppm	6 ppm	6 ppm 0.003%		Up to 0.003% of OEL for inlet and outlet values	
39 Heptanenitrile	629-08-3	Not Detected	6 ppm	TIC	х		
40 2-Methylene butanenitrile	1647-11-6	Not Detected	0.3 ppm	.3 ppm TIC X			
41 2,4-Pentadienenitrile 1615-7		Not Detected	0.3 ppm	TIC	х		

 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	0.0168 ppm	5 ppm	0.10%		Up to 0.34% of OEL for inlet values. All outlets <dl< td=""></dl<>	
Nitrosamines			·				
43 N-Nitrosodimethylamine	62-75-9	0.67 ppb	0.3 ppb	8.4-12.1%		Up to 224% of OEL for inlet values. All outlets <dl< td=""></dl<>	
44 N-Nitrosodiethylamine	55-18-5	0.07 ppb	0.1 ppb	28.7%		Up to 73.6% of OEL for inlet values. All outlets <dl< td=""></dl<>	
45 N-Nitrosomethylethylamine	10595-95-6	0.03 ppb	0.3 ppb	11.1%	х	11.1% of OEL for one outlet value. All values <dl< td=""></dl<>	
46 N-Nitrosomorpholine	59-89-2	0.05 ppb	0.6 ppb	3.33%		Up to 7.97% of OEL for inlet values. All outlets <dl< td=""></dl<>	
Organophospates							
47 Tributyl phosphate	126-73-8	0.0005 ppm	0.2 ppm	0.230%	х		
48 Dibutyl butylphosphonate	78-46-6	0.0003 ppm	0.007 ppm	4.54%	х		
Halogenated	1		· I		1		
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m3	TIC	х		
50 2-Fluoropropene	1184-60-7	Not Detected	0.1 ppm	TIC	х		
Pyridines			T				
51 Pyridine	110-86-1	0.0016 ppm	1 ppm	0.030%		Up to 0.16% of OEL for inlet values. All outlets <dl< td=""></dl<>	
52 2,4-Dimethylpyridine	108-47-4	0.0003 ppm	0.5 ppm	0.060%	х		
Organonitrites							
53 Methyl nitrite	624-91-9	Not Detected	0.1 ppm	TIC	Х		
54 Butyl nitrite	544-16-1	Not Detected	0.1 ppm	TIC	Х		
Organonitrates							
55 Butyl nitrate	928-45-0	Not Detected	2.5 ppm	TIC	х		
56 1,4-Butanediol, dinitrate	3457-91-8	Not Detected	0.05 ppm	TIC	х		
57 2-Nitro-2-methylpropane	594-70-7	Not Detected	0.3 ppm	TIC	х		
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	Not Detected	0.05 ppm	TIC	х		
Isocyanates	1		•	·	· · · · · · · · · · · · · · · · · · ·		
59 Methyl Isocyanate	624-83-9	Not Detected	20 ppb	TIC	х		

5.0 Plots of COPCs with Significant Detected Values

Of the 59 COPCs in Table 1, six had detected concentrations >10% of their corresponding OEL. These compounds (highlighted in yellow in the table) were ammonia, mercury, acetonitrile, NDMA, NDEA, and NMEA. This section provides more detail on those results, along with plots of the corresponding data. Note that Appendix E shows plots and descriptions for other COPCs with measured inlet concentrations between 2% and 10%, or DLs >10% of their corresponding OELs.

Ammonia (see Figure 1) – The DL for ammonia corresponds to ~2.6% of the OEL. For both respirator cartridges, inlet concentrations ranged from 192 to 484% of the OEL. The measured outlet concentrations from the SCOTT 7422-SD1 cartridge increased with time, eventually exceeding 300% of the OEL, although the outlet concentrations from this cartridge were somewhat scattered. Nevertheless, the measurements suggest ammonia breakthrough from the SCOTT 7422-SD1 cartridge during the second measurement period, between 2 and 4 hours of testing. The outlet measurements for the SCOTT 7422-SC1 cartridge were also somewhat scattered, with the highest measurement at 314% of the OEL. These measurements suggest ammonia breakthrough, above 10% OEL, during the 8 to 10 hour measurement period.

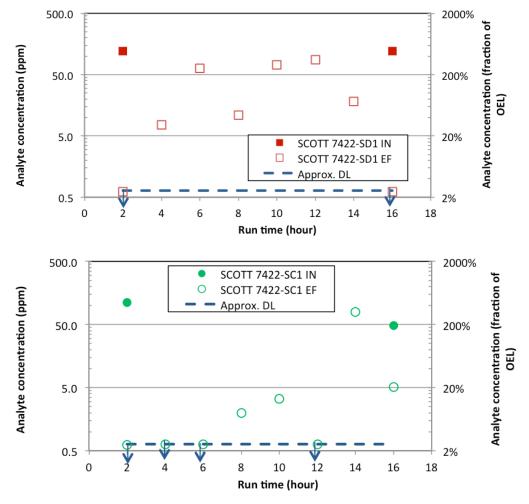


Figure 1. Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Mercury (see Figure 2) – The DL for mercury corresponds to ~7.4% of the OEL. For both respirator cartridges, inlet concentrations ranged from 30 to 34% of the OEL. All of the measured outlet concentrations from both respirator cartridges tested were below the DL for mercury. Therefore, there is no evidence of mercury breakthrough over the measured time period.

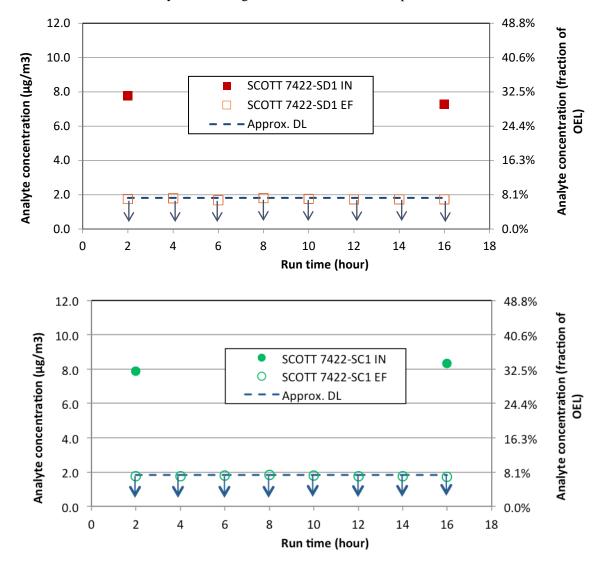


Figure 2. Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Acetonitrile (see Figure 3) – The DL for acetonitrile corresponds to ~0.001% of the OEL. For both respirator cartridges, inlet concentrations ranged from 0.2 to 0.7% of the OEL. ¹¹ All of the measured outlet concentrations from both respirator cartridges were greater than the DL for acetonitrile, but <1.5% of the OEL, with the exception of a single data point. The outlet concentration over the 8-hour period for SCOTT 7422-SC1 was measured at 12.4% of the OEL. However, because this data point is much higher than all of the other inlet and outlet values, analytical error is suspected. Future measurements, with higher inlet concentrations for acetonitrile, are recommended to fully ascertain respirator performance.

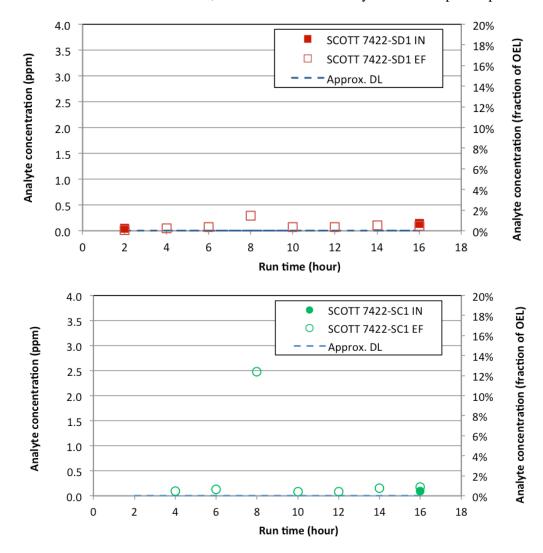


Figure 3. Plot of Measured Acetonitrile Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1).

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¹¹ Neither inlet nor outlet concentrations for the 2-hour period were recorded for the SCOTT 7422-SC1 test because of either a broken sorbent tube or analytical laboratory malfunction.

N-Nitrosodimethylamine (see Figure 4) – The DL for NDMA corresponded to ~8.4%, with an increase to 12.1% for the last few data points for the second respirator cartridge. For both respirator cartridges, inlet concentrations ranged from 43 to 224% of the OEL. All of the respirator outlet measurements were below the analytical DL for NDMA. Therefore, there is no evidence of NDMA breakthrough over the measured time period.

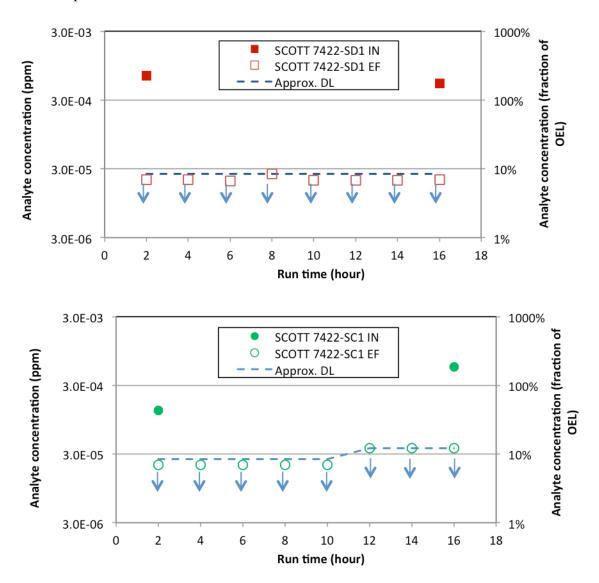


Figure 4. Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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¹² The increase in DL for samples from the SCOTT 7422-SC1 testing resulted from a change in the calculated RL from the analytical laboratory. The RL can vary for any sample batch based on the instrument performance and desorption efficiency of laboratory control samples.

N-Nitrosodiethylamine (see Figure 5) – The DL for NDEA corresponds to ~29% of the OEL. For both respirator cartridges, inlet concentrations ranged from 23 to 74% of the OEL. All of the measured outlet concentrations from both respirator cartridges were less than the DL for NDEA. Because the detection level >10%, it is recommended that this current NDEA DL (28.7% of the OEL) be used for making respirator performance determinations. Therefore, based on the outlet measurements and the revised threshold recommendation there is no evidence of breakthrough over the measured time period for either cartridge tested.

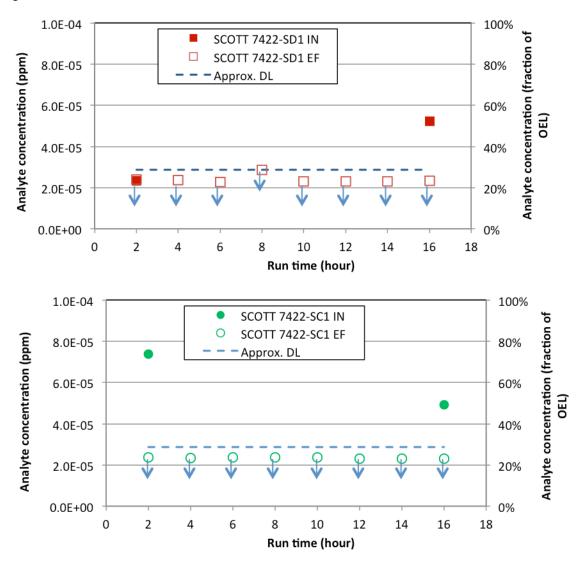


Figure 5. Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosomethylethylamine (see Figure 6) – The DL for NMEA corresponds to ~11.1% of the OEL. For both respirator cartridges, inlet concentrations ranged from 8.6 to 9.1% of the OEL, which are less than the DL for NMEA. All of the measured outlet concentrations from both respirator cartridges were less than the DL. Because the DL is >10%, it is recommended that this current NMEA DL (11.1% of the OEL) be used for making respirator performance determinations. Therefore, based on the outlet measurements and the revised threshold recommendation there is no evidence of breakthrough over the measured time period for either cartridge tested.

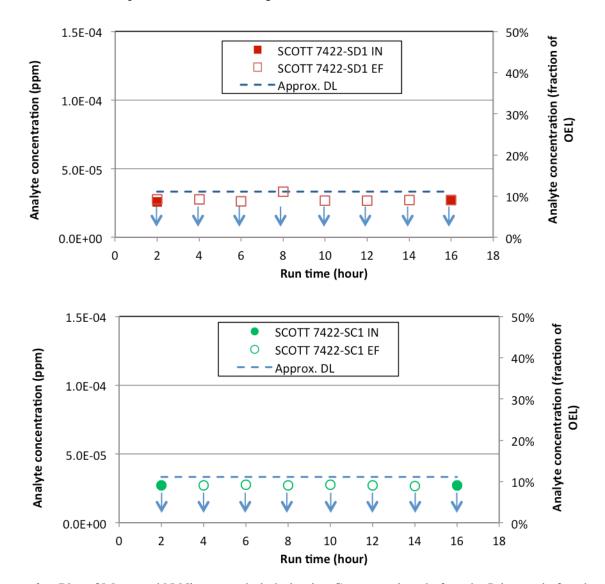


Figure 6. Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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 A-101 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 provided 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 A-101 headspace at concentrations >10% of their respective OELs and above analytical RLs. These COPCs include ammonia, nitrous oxide, mercury, 1,3-butadiene, furan, acetonitrile, methyl nitrite (TIC), and three nitrosamines: NDMA, NDEA, and N-Nitrosomorpholine. Of these 10 COPCs:

- Ammonia, mercury, NDMA, and NDEA average and maximum inlet concentrations measured in this cartridge study were generally consistent ¹³ with historic headspace measurements.
- Furan average and maximum inlet concentrations were consistently <5% of the OEL in the cartridge study, significantly lower than the historic average headspace concentration of 317% of the OEL. Historic measurements of other furan-based compounds (i.e., substituted furans) have consistently been found to be less than the RL.
- 1,3-butadiene cartridge inlet concentrations were comparable to the historical average headspace concentration of 2.9% of the OEL but less than the maximum historic concentration of 51% of the OEL.
- Acetonitrile cartridge inlet concentrations were consistently <1% of the OEL, whereas historic headspace measurements ranged from an average of 4.4% to a maximum of 26% of the OEL.
- N-Nitrosomorpholine cartridge inlet concentrations were generally consistent with the historical average headspace concentration of 11% of the OEL, but less than the maximum historic concentration of 24% of the OEL.
- Methyl nitrite was not detected in this cartridge study but has been reported in three pre-2006 headspace samples as a TIC at a concentration >300% of the OEL. This COPC has not been detected in more recent analyses of the A-101 headspace.
- Nitrous oxide was not measured in this cartridge study as previously noted but has been reported in pre-2006 headspace samples at a concentration >300% of the OEL. This COPC has only been reported as less than the RL in the more recent single analysis result from A-101.

[19]). Also in Freeman et. al. [19], 2,5-dihydrofuran, and 2-methylfuran maximums were both below the RL/DL.

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 $^{^{13}}$ Inlet concentrations were considered generally consistent if they were within $\pm 100\%$ of historic maximum and average headspace concentrations. Maximum inlet concentrations for these COPCs were 18 to 46% less than historic maxima, and average inlet concentrations ranged from 60% less to 70% more than the historic average. 14 The maximum furan measurement by using the Carbotrap 300 TDU method was 450 ppb (see Freeman et.al.

Table 2. Historical Tank A-101 Headspace Data for COPCs with Boiling Points less than 70°C (158°F)

					Historical Measurements ¹			Measurements in this Study			
C	OPC Number and Name	CAS Number	Boiling Point (°F)	OEL	# 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	1 20	<rl 250</rl 	<rl 158</rl 	<rl 500%</rl 	<rl 316%</rl 	Not N	/leasured
1	Ammonia	7664-41-7	-28	25 ppm	15 21	148 <i>800</i>	58.7* <i>257</i>	592% <i>3200%</i>	235%* 1028%	484%	348%
50	2-Fluoropropene	1184-60-7	-11	0.1 ppm	1	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<>	<rl< td=""><td>Not De</td><td>tected - TIC</td></rl<>	Not De	tected - TIC
14	Formaldehyde	50-00-0	-6	0.3 ppm	15	0.024	0.00726	8.0%	2.4%	5.2%	2.1%
53	Methyl nitrite	624-91-9	10	0.1 ppm	0	n/a <i>0.43</i>	n/a 0.318	n/a <i>430%</i>	n/a <i>318%</i>	Not Detected - TIC	
4	1,3-Butadiene	106-99-0	24	1 ppm	37	0.512	0.0287*	51%	2.9%*	2.0% (RL) ²	2.6% (RL)
42	Ethylamine	75-04-7	62	5 ppm	17	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.34%</td><td>0.10% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.34%</td><td>0.10% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.34%</td><td>0.10% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.34%</td><td>0.10% (RL)</td></rl<>	0.34%	0.10% (RL)
15	Acetaldehyde	75-07-0	69	25 ppm	24	0.142	0.0308	0.57%	0.12%	0.22%	0.13%
19	Furan	110-00-9	88	1 ppb	40	<rl< td=""><td>3.17</td><td><rl< td=""><td>317%</td><td>4.8%</td><td>1.3%</td></rl<></td></rl<>	3.17	<rl< td=""><td>317%</td><td>4.8%</td><td>1.3%</td></rl<>	317%	4.8%	1.3%
59	Methyl Isocyanate	624-83-9	103	0.02 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<>	<rl< td=""><td>Not De</td><td>tected - TIC</td></rl<>	Not De	tected - TIC
20	2,3-Dihydrofuran	1191-99-7	130	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>4.2%</td><td>2.6%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>4.2%</td><td>2.6%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>4.2%</td><td>2.6%</td></rl<></td></rl<>	<rl< td=""><td>4.2%</td><td>2.6%</td></rl<>	4.2%	2.6%
22	2-Methylfuran	534-22-5	147	1 ppb	39	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.9% (DL)</td><td>2.1%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>1.9% (DL)</td><td>2.1%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>1.9% (DL)</td><td>2.1%</td></rl<></td></rl<>	<rl< td=""><td>1.9% (DL)</td><td>2.1%</td></rl<>	1.9% (DL)	2.1%
8	Methanol	67-56-1	148	200 ppm	6	0.43	0.251	0.22%	0.13%	Not Measured	
21	2,5-Dihydrofuran	1708-29-8	152	1 ppb	40	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>2.2% (DL)</td><td>3.8%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>2.2% (DL)</td><td>3.8%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>2.2% (DL)</td><td>3.8%</td></rl<></td></rl<>	<rl< td=""><td>2.2% (DL)</td><td>3.8%</td></rl<>	2.2% (DL)	3.8%

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

Plain font in the table indicates that only the recent databases (SWIHD headspace and TWINS Industrial Hygiene) were included. Italics (second row for nitrous oxide and ammonia only) mean that the pre-2006 TWINS headspace data were also included. "n/a" indicates no historical data was found in the databases

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

[&]quot;< RL" indicates that all pertinent measurements of the analyte were less than the reporting limit

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

7.0 Conclusions

Testing was conducted during the July 22–24, 2016 period using headspace vapors from Hanford tank A-101 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 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were each assessed with the tank headspace 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 A-101 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 69 to 90°F, and the average relative humidity ranged from 45 to 94%. The inlet concentrations measured are shown in Table 1. Thus, any conclusions on respirator cartridge performance pertain to the above-stated conditions.

The following are the key conclusions from the assessment of the 59 COPCs in the current analysis:

- Based on measurements of the cartridge inlet vapor concentrations from tank A-101, four compounds had measured values that were >10% of their corresponding OELs. These COPCs were ammonia, mercury, NDMA, and NDEA. The inlet concentrations for ammonia and NDMA were >100% of their respective OELs.
- Of the compounds identified above, only ammonia had respirator cartridge outlet concentrations (for both cartridges tested) that were >10% of the OELs. These measurements indicate breakthrough for each of the cartridges tested. For the SCOTT 7422-SD1 cartridge, ammonia breakthrough above 10% OEL appeared to occur after 2 hours. For the SCOTT 7422-SC1 cartridge, ammonia breakthrough above 10% OEL appeared to occur after 8 hours.
- Inlet vapor concentrations of all other measured COPCs were below 10% of OEL thresholds, and in many cases, they also were less than the corresponding analytical DLs, indicating no COPC breakthrough above 10% of OELs for any compounds over the 16 hours of testing.

Historical concentrations of the COPCs in the A-101 headspace were analyzed to identify any differences compared to those measured in this current study. Ten COPCs, including the four measured in this study, have been measured previously in the A-101 headspace at concentrations >10% of their respective OELs and above analytical RLs. Of the 10 COPCs, ammonia, mercury, NDMA, and NDEA inlet concentrations measured in this cartridge study were generally consistent with historic headspace measurements. Of the remaining six COPCs from historic A-101 analysis, four—furan, acetonitrile, 1,3-butadiene, and N-Nitrosomorpholine—were detected at lower concentrations in cartridge testing than either average or maximum historic headspace concentrations. The remaining two COPCs were either not measured (methyl nitrite), or not analyzed (nitrous oxide).

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.

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¹⁵ 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 charged surgest than a weight of the procedures. The OEL for NDMA was catablished in 2005.

8.0 Recommendations

- Based on the measurements taken for this study, none of the COPCs, other than ammonia, indicated breakthrough behavior above 10% their OELs during the 16-hour testing period. Breakthrough of ammonia for the SCOTTS 7422-SD1 and 7422-SC1 cartridges tested on A-101 headspace vapors occurred after 2 hours and 8 hours, respectively.
- However, variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact breakthrough time, especially if OEL thresholds are exceeded.
- Additional recommendations related to NDMA and NDEA DLs, TICs, further data assessments, and future testing documented in PNNL-25860¹⁶ for respirator cartridge testing on a slipstream from the Hanford AP tank exhauster are also relevant to testing the A-101 headspace. Future testing and analysis of tank vapors with higher concentrations of COPCs such as furans should help improve understanding of cartridge performance.

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¹⁶ 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)

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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 (Richland, Washington) as a means to comprehensively test respirator cartridge performance with actual Hanford tank headspace or exhauster slip stream gases. Tank headspace or exhauster slip stream vapors are pulled direct from the source through a flexible hose connecting the tank or exhauster sampling port within the tank farm/exhauster fence line to the respirator cartridge-testing system outside the farm.[13,14] Multiple inline particulate filters are installed in the line between the tank/exhauster and test system to remove potential radioactive particulates. Each filter unit contains a hydrophobic FluoroporeTM polytetrafluoroethylene filter (Millipore Sigma, Billerica, Massachusetts) that is required pursuant to the radiological work permit. This polytetrafluoroethylene filter medium is the same material used for routine tank vapor area monitoring as well as sampling and analysis of sources (headspace and exhausters) and was selected because of its broad chemical compatibility that minimizes sorption of, or reactions with, chemical compounds. The filter medium is not expected to adversely impact the test objectives because all tank farm vapor sampling uses this type of filter medium.

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 is 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 the potential for leakage to the atmosphere is minimized until the gases/vapors are under positive pressure downstream of the vacuum pumps. By the time gases reach the vacuum pump, COPCs are essentially captured or 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. DryCal flow meters also were used downstream of the sorbent tubes to measure the flow through each sorbent tube. 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 TeflonTM tubing and fittings are used where possible because of their relatively inert nature to the vapors being analyzed. Limited portions of the assembly used acrylic, VitonTM, glass, and Masterflex C-flex tubing, which are commonly used for various vapor-sampling applications.

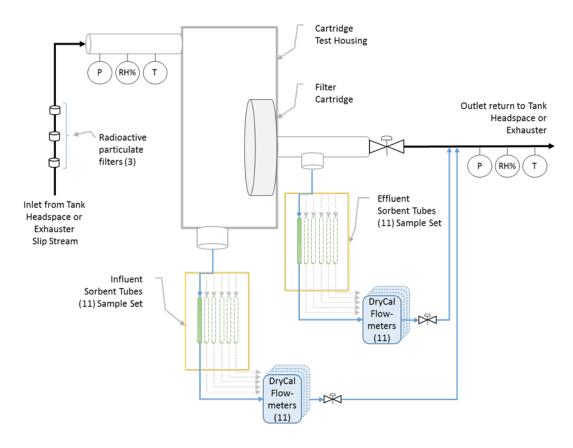


Figure A.1. General Schematic of Respirator Cartridge Test Apparatus



Figure A.2. Photographs of the Respirator Cartridge Test Equipment

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, (Part A and Part 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

C.1 Description

This appendix includes raw data of flow rate, temperature, pressure, and humidity, and analytical data for the A-101 data set. Calculations using this data are given in Appendix D.

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

- The analytical measurement results 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/reporting limit (RL) was listed as 'n/a,' the result entry in the spreadsheet was given as '0.0.'
- The use of the terms RL or detection limit (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, CBAL, 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 reporting 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:

- 'BK-BASE' means measurements obtained for blank experiment before plugging into the system. 'BASE' means measurement obtained for ambient air (fresh air vs. tank vapor).
- '6172' designations correspond to testing with the SCOTT 7422-SD1 respirator cartridge, whereas '6173' designations correspond to testing with the SCOTT 7422-SC1 respirator cartridge.
- Position designators 'A1' and 'H1' were respirator cartridge inlet measurements at 0 to 2 hours and 14 to 16 hours, respectively. The other position designators corresponded to respirator cartridge outlet measurements: A2 (0 to 2 hours), B1 (2 to 4 hours), C1 (4 to 6 hours), D1 (6 to 8 hours), (8 to 10 hours), F1 (10 to 12 hours), G1 (12 to 14 hours), and H2 (14 to 16 hours).
- For example, sample ID 16-06172-5-A1 corresponds to the first cartridge survey (16-06172), sample line 5, and the first (0 to 2 hours) influent sample bundle (A1).

The flow rate passing through the respirator cartridge was ~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 'A-Farm 7-22 7-23.xlsx' and 'A-Farm 7-23 7-24.xlsx.' The information is shown in the tables below.

WRPS provided the temperature and humidity information in files 'A-101 DRI July 22-23.xls' and 'A-101 DRI July 23-24.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).
- Prior to testing with the waste tank vapors, a 2 hour "baseline" samples is collected by running ambient outside air through the sampling system before each cartridge is installed for testing. 'BASE' means measurements obtained for ambient air (fresh air vs. tank vapor) running through the test system before initiation of tank vapor testing.
- 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.
- 'BLANK' means measurements obtained from sorbent tubes that have not had any vapor stream passed through them.

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

- SVOC: Biphenyl, Diethylphthalate, Tributyl phosphate, Dibutyl butylphosphonate, Dodecane, Hexadecane
- SVOCTIC: Undecane, Cyclotetrasiloxane, octamethyl, Decamethlycyclopentasiloxane, Dodecane,4,6-dimethyl
- VOC: 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: 2,6-Dimethyldecane, Decane, 2,3,5,8-tetramethyl-, Decane, 3,7-dimethyl-, Methenamine, Undecane, 2,6-dimethyl-
- Furans: 2,3-Dihydrofuran, 2-Pentyfuran, Furan, Tetrafuran
- 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, PyridineNitrosamines: N-Nitrosodimethylamine.

C.2 Experimental Parameters

C.2.1 Flow Rates

First Cartridge, or Survey 1 (7/22-23) A-101

Volumes Air Collected (L)

Commis Day No.		NA. J.	March				,	Ĺ					
Sample Box Nu	mber	Mach.	Mach.	A1	A2	B1	C1	D1	E1	F1	G1	H1	H2
Analyte	Line	Base 1	Base 2	71	732	01	3	51)		112
SVOC	Α	4.02	4.21	3.90	4.30	4.08	4.25	4.07	3.87	3.95	3.90	3.93	3.96
VOC	В	4.23	3.99	4.23	3.84	3.79	4.11	3.91	3.94	3.97	3.96	3.49	3.92
Furans	С	4.10	3.93	4.19	3.98	4.43	4.24	3.99	3.93	3.89	3.89	3.93	3.90
Ethylamine	D	12.21	12.46	12.61	12.87	12.14	12.52	12.17	11.81	11.84	11.69	11.91	12.05
Acetonitrile	Е	12.40	12.20	12.56	12.39	12.11	12.73	11.88	11.93	11.77	12.00	11.96	12.13
Mercury	F	30.44	30.53	30.65	30.76	30.04	31.88	29.50	29.70	29.93	30.04	29.98	29.87
Ammonia	G	24.66	24.50	24.69	24.63	24.23	25.30	24.05	23.80	22.89	24.22	23.67	23.98
Aldehyde	Η	24.40	24.45	24.65	24.12	24.40	25.74	24.56	23.89	23.61	23.68	23.69	23.89
1,3-Butadiene	- 1	24.46	24.16	24.69	24.50	23.89	24.95	24.14	23.85	23.47	23.89	23.74	23.92
Pyridine	J	124.38	124.08	124.98	123.66	124.38	130.47	122.40	121.80	121.80	121.80	120.60	120.00
Nitrosamines	K	240.00	241.62	243.30	240.00	240.30	251.81	197.06	241.80	240.00	238.20	240.60	234.00

Flow Rates (ml/min)

Sample Box Nu	mber	Mach.	Mach.	A1	A2	B1	C1	D1	E1	F1	G1	Н1	H2
Analyte	Line	Base 1	Base 2	AI	AZ	PI	CI	DI		Lī	GI	D.1	П2
SVOC	Α	33.48	35.12	32.54	35.81	34.00	33.76	33.12	32.29	32.88	32.53	32.77	33.00
VOC	В	35.22	33.22	35.28	31.97	31.56	32.66	31.77	32.83	33.10	33.02	29.11	32.70
Furans	С	34.20	32.72	34.95	33.15	36.88	33.63	32.43	32.79	32.41	32.41	32.79	32.50
Ethylamine	D	101.76	103.83	105.07	107.28	101.18	99.36	98.92	98.38	98.69	97.45	99.22	100.40
Acetonitrile	Е	103.31	101.65	104.65	103.22	100.88	101.05	96.61	99.45	98.05	99.98	99.66	101.10
Mercury	F	253.69	254.38	255.39	256.32	250.34	252.99	239.85	247.47	249.40	250.32	249.83	248.95
Ammonia	G	205.50	204.15	205.71	205.26	201.91	200.82	195.54	198.33	190.75	201.86	197.28	199.85
Aldehyde	Н	203.35	203.79	205.39	201.00	203.31	204.27	199.65	199.07	196.78	197.32	197.41	199.10
1, 3-Butadiene	- 1	203.85	201.34	205.79	204.13	199.08	198.04	196.23	198.79	195.62	199.12	197.86	199.35
Pyridine	J	1036.5	1034.0	1041.5	1030.5	1036.5	1035.5	995.1	1015.0	1015.0	1015.0	1005.0	1000.0
Nitrosamines	K	2000.0	2013.5	2027.5	2000.0	2002.5	1998.5	1602.1	2015.0	2000.0	1985.0	2005.0	1950.0

Notes: VOC: volatile organic compound; SVOC: semi-volatile organic compound.

Second Cartridge, or Survey 2 (7/23-7/24) A-101

Volumes Air Collected (L)

								-,					
Sample Box Nu	mber	Mach.	Mach.	A1	A2	B1	C1	D1	E1	F1	G1	H1	H2
Analyte	Line	Base 1	Base 2	712	7.12		0.1		1		0.1		
SVOC	Α	3.94	4.33	2.25	3.75	3.79	3.95	3.84	3.89	3.92	0.00	1.16	1.85
VOC	В	4.23	3.96	4.22	4.08	3.91	3.94	3.91	3.92	3.92	3.96	3.88	3.90
Furans	С	4.18	3.93	4.06	3.93	4.01	4.09	3.80	3.92	3.94	4.03	3.92	3.99
Ethylamine	D	12.45	12.54	12.37	12.62	12.63	12.35	11.99	11.77	11.65	11.83	11.99	12.08
Acetonitrile	Е	12.53	12.33	12.03	12.17	11.93	12.09	12.07	11.86	11.88	11.72	11.95	11.81
Mercury	F	30.38	30.75	30.45	30.68	30.29	30.19	29.69	29.86	29.70	29.83	29.74	30.12
Ammonia	O	24.34	24.57	25.49	24.47	24.05	24.14	23.82	23.85	23.59	23.80	23.86	23.93
Aldehyde	Н	24.15	24.50	24.45	23.98	24.11	24.27	24.38	28.71	23.88	23.62	23.81	23.74
1,3-Butadiene	-1	24.33	24.51	24.26	18.36	24.13	24.31	24.18	23.66	23.82	23.71	23.89	23.59
Pyridine	J	123.00	122.22	123.60	120.60	121.80	123.00	121.80	120.60	120.60	120.60	121.20	120.60
Nitrosamines	K	240.96	244.80	241.80	242.40	243.60	241.80	244.20	240.60	242.40	241.20	241.80	237.60

Flow Rates (ml/min)

Sample Box Nu	mber	Mach.	Mach.	A1	A2	B1	C1	D1	E1	F1	G1	H1	H2
Analyte	Line	Base 1	Base 2	Z1	AZ	D1	J	DI		-1	5	1	П2
SVOC	Α	32.87	36.05	19.75	32.93	31.61	32.92	32.00	32.40	32.67	0.00	9.70	15.45
VOC	В	35.24	32.97	37.01	35.81	32.60	32.85	32.55	32.65	32.70	33.00	32.31	32.50
Furans	С	34.85	32.71	35.61	34.51	33.44	34.10	31.66	32.65	32.80	33.60	32.66	33.25
Ethylamine	D	103.72	104.52	108.52	110.66	105.26	102.88	99.89	98.06	97.10	98.59	99.95	100.65
Acetonitrile	Е	104.41	102.73	105.51	106.79	99.41	100.73	100.59	98.85	99.00	97.70	99.60	98.45
Mercury	F	253.14	256.28	267.08	269.15	252.41	251.60	247.39	248.83	247.46	248.55	247.85	251.00
Ammonia	G	202.84	204.77	212.44	214.64	200.41	201.13	198.49	198.75	196.60	198.37	198.80	199.45
Aldehyde	Н	201.24	204.20	214.50	210.34	200.91	202.24	203.17	239.27	199.00	196.80	198.45	197.85
1, 3-Butadiene	_	202.74	204.23	212.78	161.07	201.12	202.57	201.46	197.17	198.50	197.61	199.10	196.60
Pyridine	J	1025.0	1018.5	1084.2	1057.9	1015.0	1025.0	1015.0	1005.0	1005.0	1005.0	1010.0	1005.0
Nitrosamines	K	2008.0	2040.0	2121.1	2126.3	2030.0	2015.0	2035.0	2005.0	2020.0	2010.0	2015.0	1980.0

C.2.2 Temperature, Pressure, and Relative Humidity

First Cartridge, or Survey 1 - A-101 - 28 L/min through main respirator

Influent- Pr	e	Name								
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
Temperature	F	73.5	81.9	87.1	85.2	84.3	74	69.1	68.6	68.6
Pressure	Torr	737.9	734.2	735.2	735.2	735.6	736.4	738	737.3	736.2
Relative Humidity	%	62.4	45.3	66.7	72.7	75.1	86.1	78.7	82.4	88.8
NH3	ppm									
VOC	ppm									
Influent - Po	st				After 9	Sample Ta	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
Temperature	F	81.4	89.8	85	85.1	75.3	69.4	68.4	69.4	68.6
Pressure	Torr	738.1	733.7	735.1	735.4	736.4	737.1	737.9	737.2	736.1
Relative Humidity	%	51.1	65.5	73.8	73.9	86.9	87.8	85.7	77.8	84.2
NH3	ppm		99+	~100 d						
VOC	ppm		8.53							
Effluent - Pi	re				After	Sample Ta	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
Temperature	F	73.2	81.3	86.5	86.5	84.4	75.9	70.2	68.8	66.9
Pressure	Torr	370.3	376.1	380.8	385.3	383.3	384	391.1	389.2	393.1
Relative Humidity						000.0				
Relative numbers	%	35.8	33.1	37.1	37.2	38.1	39.9	42.2	42.3	42.1
NH3	% ppm	35.8	33.1	37.1			39.9	42.2	42.3	42.1
		35.8	33.1	37.1			39.9	42.2	42.3	42.1
NH3	ppm ppm	35.8	33.1	37.1	37.2			42.2	42.3	42.1
NH3 VOC	ppm ppm	35.8 Baseline	33.1 A	37.1 B	37.2	38.1		42.2 F	42.3 G	42.1 H
NH3 VOC Effluent- Po	ppm ppm st				37.2	38.1	aken			
NH3 VOC Effluent- Po Reading	ppm ppm st UOM	Baseline	A	В	37.2 After S	38.1 Sample Ta	aken E	F	G	Н
NH3 VOC Effluent- Po Reading Temperature	ppm ppm st UOM	Baseline 80.2	A 87.9	B 88.4	37.2 After 5 C 86.4	38.1 Sample Ta D 78.4	aken E 71	F 68.9	G 68	H 66.9
NH3 VOC Effluent- Po Reading Temperature Pressure	ppm ppm st UOM F Torr	Baseline 80.2 395.1	A 87.9 402.9	B 88.4 398.1	37.2 After 5 C 86.4 398.5	38.1 Sample Ta D 78.4 389	aken E 71 395.4	F 68.9 393.9	G 68 394.3	H 66.9 396

Second Cartridge, or Survey 2 - A-101 - 25 L/min through main respirator (pre at 30L, post at 20L)

Influent- Pr	е	Saseline A								
Reading	UOM	Baseline	Α	В	С	D	Е	F	G	н
Temperature	F	71.4	83.6	85.4	88.2	87.4	84.4	77.2	73.9	70.1
Pressure	Torr	793.3	735.5	735.7	734.9	734.1	733.1	733.9	735.1	733.8
Relative Humidity	%	78.7	89	94.1	72.6	72.4	77.4	83.5	81.5	82
NH3	ppm									
VOC	ppm									
Influent - Po	st	Baseline A B C D E F G H 82.1 87.9 88.6 87.3 87.5 77.3 74.9 72.9 68.7 738.5 735.1 734.7 734.3 733.6 733.7 734.2 735 734								
Reading	UOM	Baseline	Α	В	С	D	E	F	G	н
Temperature	F	82.1	87.9	88.6	87.3	87.5	77.3	74.9	72.9	68.7
Pressure	Torr	738.5	735.1	734.7	734.3	733.6	733.7	734.2	735	734
Relative Humidity	%	55.9	84.8	74	73.5	71.3	84.9	82.9	79.6	80.7
NH3	ppm		99+							
VOC	ppm		3.8							
Effluent - Pr	·e				After 9	Sample T	aken			
Effluent - Pr Reading	e UOM	Baseline	А	В	3/20/20/20/20	NAME OF TAXABLE PARTY.	-	F	G	Н
	20	Baseline 70.8	A 83.9	B 85.4	3/20/20/20/20	NAME OF TAXABLE PARTY.	-	F 80.8	G 74.4	Н 69.9
Reading	UOM			_	С	D	E			
Reading Temperature	UOM F	70.8	83.9	85.4	c 90	D 91.9	E 89.1	80.8	74.4	69.9
Reading Temperature Pressure	UOM F Torr	70.8 381.9	83.9 391.1	85.4 390.9	90 392.7	91.9 403.7	89.1 399.4	80.8 401.3	74.4 398.3	69.9 399.5
Reading Temperature Pressure Relative Humidity	UOM F Torr %	70.8 381.9	83.9 391.1	85.4 390.9	90 392.7	91.9 403.7	89.1 399.4	80.8 401.3	74.4 398.3	69.9 399.5
Reading Temperature Pressure Relative Humidity NH3	F Torr % ppm ppm	70.8 381.9	83.9 391.1	85.4 390.9	90 392.7 35.4	91.9 403.7	89.1 399.4 34.7	80.8 401.3	74.4 398.3	69.9 399.5
Reading Temperature Pressure Relative Humidity NH3 VOC	F Torr % ppm ppm	70.8 381.9	83.9 391.1	85.4 390.9	90 392.7 35.4	91.9 403.7 33.9	89.1 399.4 34.7	80.8 401.3	74.4 398.3	69.9 399.5
Reading Temperature Pressure Relative Humidity NH3 VOC Effluent- Po	UOM F Torr % ppm ppm	70.8 381.9 33.8	83.9 391.1 34.6	85.4 390.9 40.8	C 90 392.7 35.4 After S	91.9 403.7 33.9	89.1 399.4 34.7	80.8 401.3 38	74.4 398.3 40.7	69.9 399.5 43
Reading Temperature Pressure Relative Humidity NH3 VOC Effluent- Po Reading	UOM F Torr % ppm ppm st UOM	70.8 381.9 33.8 Baseline	83.9 391.1 34.6	85.4 390.9 40.8	90 392.7 35.4 After S	91.9 403.7 33.9 Sample To	89.1 399.4 34.7 aken	80.8 401.3 38	74.4 398.3 40.7	69.9 399.5 43
Reading Temperature Pressure Relative Humidity NH3 VOC Effluent- Po Reading Temperature	UOM F Torr % ppm ppm st UOM F	70.8 381.9 33.8 Baseline 84.1	83.9 391.1 34.6 A 89.9	85.4 390.9 40.8 B 92.5	C 90 392.7 35.4 After S C 93	91.9 403.7 33.9 Sample To D	89.1 399.4 34.7 aken E 82.1	80.8 401.3 38 F 77.1	74.4 398.3 40.7 G 73.2	69.9 399.5 43 H 69.3
Reading Temperature Pressure Relative Humidity NH3 VOC Effluent- Po Reading Temperature Pressure	UOM F Torr % ppm ppm st UOM F Torr	70.8 381.9 33.8 Baseline 84.1 407.4	83.9 391.1 34.6 A 89.9 411	85.4 390.9 40.8 B 92.5 408.2	C 90 392.7 35.4 After S C 93 408.1	91.9 403.7 33.9 Sample To D 91.4 406.8	89.1 399.4 34.7 aken E 82.1 404.4	80.8 401.3 38 F 77.1 404.7	74.4 398.3 40.7 G 73.2 401.4	69.9 399.5 43 H 69.3 402.1

C.3 Raw Analytical Data

C.3.1 **SVOC and SVOCTIC**

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

J - Estimated

\$16T021633 \$16T021633 S16T021633 imple# R A# CAS# VAPOR-TDU SVOA #2 SDG Number: Customer Sample ID: 16-06173-1-A1 Customer Sample ID: 16-06173-1-A1 92-52-4 629-50-5 544-76-3 84-66-2 95-48-7 3891-98-3 126-73-8 78-46-6 629-59-4 112-40-3 108-39-4M Analyte Tridecane Dodecane Dibutyl butylphosphonate Cresol (m & p) 2,6,10-Trimethyldodecane Tributyl phosphate Tetradecane Diethylphthalate Biphenyl 2-Methylphenol Hexadecane-NGS NGS NGS NGS NGS NGS

00

S16T021633 S16T021633 S16T021633 S16T021633 S16T021633 S16T021633 S16T021633 S16T021633

100

43.9 ^3.3 <7.0 <3.6

<3.9

n/a n/a n/a n/a

n/a n/a n/a n/a n/a n/a п/a n/a n/a

n/a n/a n/a n/a n/a n/a n/a n/a

<3.3

n/a n/a

n/a

0.55 3.9

ηVa n/a

<0.55

30

<7.0 <3.6

4.0 **<5.6** <4.9

629-78-7

Pentadecane

2 Jes 8

Heptadecane

STD %

Blank

Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags

Data Summary of All Results Cartridge Evaluation 22 - Aug - 2016 13:45:29 DSRHardcopyWOLimits 3.0.11b

Sample Group: 20162142

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162142

	Company of the Compan	50000000		2			2000		2	CACTOOLOG
	n/a	<5.6	<5.6	98	NGS	Cresol (m & p)	108-39-4M		634	S16T021634
	n/a	<4.9	<4.9	92	NGS	2-Methylphenol	95-48-7	Г	634	S16T021634
	n/a	<3.9	<3.9	98	NGS	2,6,10-Trimethyldodecane	3891-98-3	Г	634	S16T021634
							VAPOR-TDU SVOA #2	AS D	OR-TE	VAP
AV	Result Duplicate Av	Result	Blank	STD %	Unit	Analyte	A# CAS#	A#	20	Sample#
						Customer Sample ID: 16-06173-1-A2	ner Sample	ston	Cu	
						Customer Sample ID: 16-06173-1-A2	r Sample II	ome	Cust	
							ē.	dmu	SDG Number:	S

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD % Spk R	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TE	VAPOR-TDU SVOA #2											
S16T021634	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021634	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021634	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021634	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021634	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021634	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021634	112-40-3	Dodecane	NGS	97	<0.55	48	n/a	n/a	n/a	n/a	0.55	n/a
S16T021634	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021634	629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021634	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021634	629-50-5	Tridecane	NGS	94	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a
S16T021634	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021634	629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected
J - Estimated

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162142
SDG Number:
Customer Sample ID: 16-06173-1-B1
Customer Sample ID: 16-06173-1-B1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flag
VAPOR-TD	VAPOR-TDU SVOA #2												
S16T021635	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021635	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021635	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021635	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021635	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021635	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021635	112-40-3	Dodecane	NGS	97	<0.55	87	n/a	n/a	n/a	n/a	0.55	n/a E	ım
S16T021635	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021635	629-59-4	Tetradecane	NGS	100	<3.9	7.4	n/a	n/a	n/a	n/a	3.9	n/a J	
S16T021635	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021635	629-50-5	Tridecane	NGS	94	<1.6	26	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021635	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	
S16T021635	629-62-9	Pentadecane	NGS	100	<3.0	4.3	n/a	n/a	n/a	n/a	3.0	n/a J	_

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Cartridge Evaluation
Data Summary of All Results

Page: 4

Sample Group: 20162142

SDG Number: Customer Sample ID: 16-06173-1-BLANK Customer Sample ID: 16-06173-1-BLANK

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	U SVOA #2	3	100	100								
S16T021636	3891-98-3	 2,6,10-Trimethyldodecane 	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021636	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021636	108-39-4M	M Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021636	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021636	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021636	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021636	112-40-3	Dodecane	NGS	97	<0.55	0.70	n/a	n/a	n/a	n/a	0.55	n/a J
S16T021636	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021636	629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021636	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021636	629-50-5	Tridecane	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021636	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021636	629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162142 SDG Number: Customer Sample ID: 16-06173-1-C1 Customer Sample ID: 16-06173-1-C1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TD	VAPOR-TDU SVOA #2		87		100							
S16T021637	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021637	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021637	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021637	92-52-4	Biphenyi	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021637	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021637	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021637	112-40-3	Dodecane	NGS	97	<0.55	110	n/a	n/a	n/a	n/a	0.55	n/a E
S16T021637	544-76-3	Hexadecane-	NGS	94	<3.3	8.9	n/a	n/a	n/a	n/a	3.3	n/a J
S16T021637	629-59-4	etradecane	NGS	100	<3.9	12	n/a	n/a	n/a	n/a	3.9	n/a
S16T021637	126-73-8	ributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a Q
S16T021637	629-50-5	ridecane .	NGS	94	<1.6	58	n/a	n/a	n/a	n/a	1.6	n/a E
S16T021637	629-78-7	Heptadecane	NGS	91	<2.4	12	n/a	n/a	n/a	n/a	2.4	n/a Q
S16T021637	629-62-9	Pentadecane	NGS	100	<3.0	15	n/a	n/a	n/a	n/a	3.0	n/a

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Q - Qualitative

N - Named TIC

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J - Estimated

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162142
SDG Number:
Customer Sample ID: 16-06173-1-D1
Customer Sample ID: 16-06173-1-D1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flag
VAPOR-TDU SVOA #2	OVS U	A #2												
S16T021638	ω	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021638	(0)	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	e/u	n/a	n/a	n/a	4.9	n/a	
S16T021638	_	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021638	60	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021638	7	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021638	8	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021638	_	12-40-3	Dodecane	NGS	97	<0.55	33	n/a	n/a	n/a	n/a	0.55	n/a	
S16T021638	CD CD	544-76-3	Hexadecane-	NGS	94	<3.3	6.7	n/a	n/a	n/a	n/a	3.3	n/a J	
S16T021638	0	629-59-4	Tetradecane	NGS	100	<3.9	7.0	n/a	n/a	n/a	n/a	3.9	n/a J	
S16T021638	1	26-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021638	6	629-50-5	Tridecane	NGS	94	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021638	0	629-78-7	Heptadecane	NGS	91	<2.4	8.6	n/a	n/a	n/a	n/a	2,4	n/a J	
S16T021638	0	629-62-9	Pentadecane	NGS	100	<3.0	10	n/a	n/a	n/a	n/a	3.0	n/a	

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Cartridge Evaluation
Data Summary of All Results

Page: 7

Sample Group: 20162142

SDG Number: Customer Sample ID: 16-06173-1-E1 Customer Sample ID: 16-06173-1-E1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average RPD % Spk Rec	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	VSV	OA #2											
S16T021639		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021639		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021639		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021639		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021639		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021639		84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021639		112-40-3	Dodecane	NGS	97	<0.55	57	n/a	n/a	n/a	n/a	0.55	n/a E
S16T021639		544-76-3	Hexadecane-	NGS	94	<3.3	4.0	n/a	n/a	n/a	n/a	3.3	n/a J
S16T021639		629-59-4	Tetradecane	NGS	100	<3.9	6.1	n/a	n/a	n/a	n/a	3.9	n/a J
S16T021639		126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021639		629-50-5	Tridecane	NGS	94	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a
S16T021639		629-78-7	Heptadecane	NGS	91	<2.4	3.6	n/a	n/a	n/a	n/a	2.4	n/a J
S16T021639		629-62-9	Pentadecane	NGS	100	<3.0	7.5	1/2	nla	n/a	n/a	3.0	n/a l

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-EFF-BASE Customer Sample ID: 16-06173-1-EFF-BASE

			Control of the last of the las											
Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	U SVO	A #2												
S16T021640	3	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021640	9	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021640		08-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021640	9	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021640	7	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021640	00	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021640	_	12-40-3	Dodecane	NGS	97	<0.55	58	n/a	n/a	n/a	n/a	0.55	n/a E	
S16T021640	Ch Ch	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021640	0	629-59-4	Tetradecane	NGS	100	<3.9	6.3	n/a	n/a	n/a	n/a	3.9	n/a J	_
S16T021640	_	26-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021640	0	629-50-5	Tridecane	NGS	94	<1.6	26	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021640	6	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	
S16T021640	0	629-62-9	Pentadecane	NGS	100	<3.0	7.2	n/a	n/a	n/a	n/a	3.0	n/a J	

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

J - Estimated

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162142 SDG Number: Customer Sample ID: 16-06173-1-F1 Customer Sample ID: 16-06173-1-F1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	NS UC	OA #2		j						Ì			
S16T021641		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021641		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a		4.9	n/a
S16T021641		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a		5.6	n/a
S16T021641		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a		4.0	n/a
S16T021641		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a		3.6	n/a
S16T021641		84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a		7.0	n/a
S16T021641		112-40-3	Dodecane	NGS	97	<0.55	30	n/a	n/a	n/a		0.55	n/a
S16T021641		544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021641		629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021641		126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021641		629-50-5	Tridecane	NGS	94	<1.6	9.1	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021641		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a		2.4	n/a
S16T021641		629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-G1 Customer Sample ID: 16-06173-1-G1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flag
VAPOR-TDU SVOA #2	VS U	OA #2												
S16T021642		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021642		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021642		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021642		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021642		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021642		84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021642		112-40-3	Dodecane	NGS	97	<0.55	1.5	n/a	n/a	n/a	n/a	0.55	n/a J	
S16T021642		544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021642		629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021642	П	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a Q	
S16T021642		629-50-5	Tridecane	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021642		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a Q	
S16T021642		629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	

T - Tentatively Identified Compound
Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-H1 Customer Sample ID: 16-06173-1-H1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	k Rec %	Det Limit Cnt Err % Qual Flags	nt Err % Q	ual Flags
VAPOR-TDU SVOA #2	VS U	OA #2												
S16T021643		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	3.9	n/a	n/a	в/п	n/a	3.9	n/a	
S16T021643		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021643		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021643		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021643		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021643		84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021643		112-40-3	Dodecane	NGS	97	<0.55	12	n/a	n/a	n/a	· n/a	0.55	n/a	
S16T021643		544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021643		629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021643		126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5,6	n/a	
S16T021643		629-50-5	Tridecane	NGS	94	<1.6	4.7	n/a	n/a	n/a	n/a	1.6	n/a J	
S16T021643		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	
S16T021643		629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	

T - Tentatively Identified Compound
Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162142
SDG Number:
Customer Sample ID: 16-06173-1-H2
Customer Sample ID: 16-06173-1-H2

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	VS U	/OA #2											
S16T021644		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021644		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021644		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021644		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021644		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021644		84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021644		112-40-3	Dodecane	NGS	97	<0.55	18	n/a	n/a	n/a	n/a	0.55	n/a
S16T021644		544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021644		629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021644	Г	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021644		629-50-5	Tridecane	NGS	94	<1.6	6.7	n/a	n/a	n/a	n/a	1.6	r/a J
S16T021644		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021644		629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a

T - Tentatively Identified Compound
Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected J - Estimated

Sample Group: 2 SDG Number:	Sample Group: 20162142 SDG Number:	ν					,					
Custo Cus	omer Sample I stomer Sample	Customer Sample ID: 16-06173-1-IN-BASE Customer Sample ID: 16-06173-1-IN-BASE										
Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	U SVOA #2											
S16T021645	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021645	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a
S16T021645	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021645	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021645	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021645	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021645	112-40-3	Dodecane	NGS	97	<0.55	52	n/a	n/a	n/a	n/a	0.55	n/a E
S16T021645	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021645	629-59-4	Tetradecane	NGS	100	<3.9	4.3	n/a	n/a	n/a	n/a	3.9	n/a J
S16T021645	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021645	629-50-5	Tridecane	NGS	94	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a
S16T021645	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021645	629-62-9	Pentadecane	NGS	100	<3.0	4.5	n/a	n/a	n/a	n/a	3.0	n/a J

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-A1
Customer Sample ID: 16-06173-1-A1

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Sample# R	ğ	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	NOV	#2						
S16T021633			Unknown-1		4.35	NGS	120 J	JT
S16T021633			Acetophenone	98-86-2	5.18	NGS	13	13 JNT
S16T021633			Undecane	1120-21-4	5.45	NGS	41 JNT	JNT
S16T021633			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	130 JNT	JNT
S16T021633			Ethanol, 2-phenoxy-	122-99-6	6.50	NGS	32 JN	TNL
S16T021633			Benzothiazole	95-16-9	6.59	NGS	31 JNT	JNT
S16T021633			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	30 JNT	JNT
S16T021633			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	JNL 86	JNT

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected J - Estimated

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-A2
Customer Sample ID: 16-06173-1-A2

Sample# R	₽	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	VOA:	#2						
S16T021634			Unknown-1		4.35	NGS	110 J	П
S16T021634	Ц		Undecane	1120-21-4	5.45	NGS	61 JNT	INT
S16T021634	Ц		2-Nonen-1-ol	22104-79-6	5.50	NGS	27 JNT	TN
S16T021634	Ш		Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	120 JNT	INT
S16T021634	Ц		Benzothiazole	95-16-9	6.60	NGS	73 JN	INT
S16T021634			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	44 JNT	TNI
S16T021634	Ц		Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	30 JNT	INT
S16T021634			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.26	NGS	36 JNT	TN

N - Named TIC

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected J - Estimated

C.20

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-B1 Customer Sample ID: 16-06173-1-B1

Sample# R	¥.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021635			Benzaldehyde	100-52-7	4.24	NGS	1NL 89	JUT
S16T021635			Unknown-1		4.35	NGS	260 JT	JT
S16T021635			Phenol	108-95-2	4.43	NGS	27 JNT	JNT
S16T021635			2-Propyl-1-pentanol	58175-57-8	4.84	NGS	55	55 JNT
S16T021635			1-Octene, 3,7-dimethyl-	4984-01-4	4.89	NGS	45	45 JNT
S16T021635			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	78	78 JNT
S16T021635			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	24	24 JNT
S16T021635			Acetophenone	98-86-2	5.19	NGS	57	57 JNT
S16T021635			Benzene, 1-methyl-4-(2-propeny	3333-13-9	5.35	NGS	80 JNT	JUL
S16T021635			Undecane	1120-21-4	5.45	NGS	240 JNT	TNT
S16T021635			Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	27 JNT	TNL
S16T021635			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	110 JNT	TNL
S16T021635			Benzaldehyde, 3-ethyl-	34246-54-3	6.05	NGS	54 JNT	TNT
S16T021635			Benzothiazole	95-16-9	6.62	NGS	95 JNT	JNT
S16T021635			2-Propenoic acid, octyl ester	2499-59-4	6.67	NGS	. 46	46 JNT
S16T021635			Acetic acid, trifluoro-, 3,7-d	28745-07-5	6.72	NGS	25 JNT	TNT
S16T021635			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.91	NGS	64 JNT	JNT
S16T021635			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	45	45 JNT
S16T021635			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.27	NGS	49 JNT	JNT

N - Named TIC

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Customer Sample ID: 16-06173-1-C1
Customer Sample ID: 16-06173-1-C1

Sample# R	\$ \$	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	NOA	#2			0.00			
S16T021637			Unknown-1		4.35	NGS	190 JT	JT
S16T021637			2-Propyl-1-pentanol	58175-57-8	4.84	NGS	32	32 JNT
S16T021637			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	TNL 78	JNT
S16T021637			Acetophenone	98-86-2	5.19	NGS	44	TNL
S16T021637	Ц		Undecane	1120-21-4	5.45	NGS	150 JNT	JNT
S16T021637			Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	26	26 JNT
S16T021637			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	160 JNT	JNT
S16T021637	Ц		Hexanoic acid, 2-ethyl-	149-57-5	5.80	NGS	28	28 JNT
S16T021637			Benzothiazole	95-16-9	6.62	NGS	110 JNT	TNL
S16T021637			1-Octanol, 3,7-dimethyl-	106-21-8	6.67	NGS	29	29 JNT
S16T021637			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.91	NGS	80	NT OB
S16T021637			Dodecamethylcyclohexasiloxane	540-97-6	7.08	NGS	75	75 JNT
S16T021637			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.27	NGS	65	65 JNT

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-D1 Customer Sample ID: 16-06173-1-D1

					Retention Time			
Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021638			Unknown-1		4.35	NGS	190 JT	JT
S16T021638			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	51	51 JNT
S16T021638			Acetophenone	98-86-2	5.19	NGS	36	36 JNT
S16T021638			Undecane	1120-21-4	5,45	NGS	100 JNT	JNT
S16T021638			Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	22	22 JNT
S16T021638			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	110 JNT	JNT
S16T021638			Benzothiazole	95-16-9	6.60	NGS	28	28 JNT
S16T021638			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	28	28 JNT
S16T021638			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	50	50 JNT

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected J - Estimated

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-E1
Customer Sample ID: 16-06173-1-E1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021639			Unknown-1		4.35	NGS	150 JT	JT
S16T021639			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	37	37 JNT
S16T021639			Acetophenone	98-86-2	5.19	NGS	26	26 JNT
S16T021639			Undecane	1120-21-4	5.45	NGS	110 JNT	JNT
S16T021639			Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	24 JNT	JNT
S16T021639			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	110 JNT	TNT
S16T021639			Benzothiazole	95-16-9	6.61	NGS	79	TNL 97
S16T021639			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	47 JNT	JNT
S16T021639			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	38	38 JNT
S16T021639			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.26	NGS	35 JNT	TNT

Customer Sample ID: 16-06173-1-EFF-BASE
Customer Sample ID: 16-06173-1-EFF-BASE

					Potention Time			
Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021640			Unknown-1		4.35	NGS	200 JT	JT
S16T021640			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	25	25 JNT
S16T021640			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	45	45 JNT
S16T021640			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	15	15 JNT
S16T021640			Acetophenone	98-86-2	5.18	NGS	22	22 JNT
S16T021640			Undecane	1120-21-4	5.45	NGS	110	110 JNT
S16T021640			Nonanal	124-19-6	5.50	NGS	31	31 JNT
S16T021640			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	94	TNL
S16T021640			Benzothiazole	95-16-9	6.60	NGS	50	50 JNT
S16T021640			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	38	38 JNT
S16T021640			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	28	28 JNT
S16T021640			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.26	NGS	30	30 JNT

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

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Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-F1
Customer Sample ID: 16-06173-1-F1

		Carried	acronic cumpic in					
Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021641			Unknown-1		4.35	NGS	97 JT	JT
S16T021641			Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	30 JNT	JNT
S16T021641			Acetophenone	98-86-2	5.18	NGS	11	1 JNT
S16T021641			Undecane	1120-21-4	5.45	NGS	1NL 69	JNT
S16T021641			Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	15 JNT	JNT
S16T021641			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	76 JN	JNT
S16T021641			Benzothiazole	95-16-9	6.60	NGS	52 JNT	JNT
S16T021641			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	27 JNT	JNT
S16T021641			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.26	NGS	26 JNT	JNT

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

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Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-G1
Customer Sample ID: 16-06173-1-G1

S16T021642 QC Type Undecane 1120-21-4 CAS No. 5.44 NGS 5.5 JNT Qual Flags

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N - Named TIC

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

J - Estimated

C.27

NA = Not Analyzed, ND = Not Detected
J - Estimated

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162142
SDG Number:
Customer Sample ID: 16-06173-1-H1
Customer Sample ID: 16-06173-1-H1

Sample# F	~ >	#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	US UC	OA #2							
S16T021643		-		Unknown-1		4.35	NGS	rr 62	JT
S16T021643		Н		Undecane	1120-21-4	5.44	NGS	21	21 JNT
S16T021643	Н	Н		Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	11	JNT
S16T021643	_	Н	0.000	Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	38 JNT	JNT
S16T021643	_	-		Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	7.1	TNL

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Data

Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-H2
Customer Sample ID: 16-06173-1-H2

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	AOVS	#2						
S16T021644			Unknown-1		4.35	NGS	85 J1	Ä
S16T021644			Acetophenone	98-86-2	5.18	NGS	5.5 JN	TNT
S16T021644			Decane	124-18-5	5.45	NGS	27 JN	JNT
S16T021644			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	91 JN	TNL
S16T021644			Unknown-2		6.64	NGS	27	ד
S16T021644			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	9.7 JNT	TN

T - Tentatively Identified Compound Q - Qualitative

N - Named TIC

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected
J - Estimated

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Sample Group: 20162142 SDG Number:

Customer Sample ID: 16-06173-1-IN-BASE
Customer Sample ID: 16-06173-1-IN-BASE

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	NOA #	#2						
S16T021645	Ц		Unknown-1		4.35	NGS	230 JT	JT
S16T021645			Unknown-2		4.83	NGS	47	JT
S16T021645			2,6-Dimethyldecane	13150-81-7	5.05	NGS	39 JNT	TNT
S16T021645			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	10	10 JNT
S16T021645			Acetophenone	98-86-2	5.19	NGS	24 JNT	JUT
S16T021645			Undecane	1120-21-4	5.45	NGS	1NF 66	JUL
S16T021645			Nonanal	124-19-6	5.50	NGS	26 JNT	TNT
S16T021645	Ц		Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	150 JNT	JUT
S16T021645			Benzothiazole	95-16-9	6.61	NGS	78	78 JNT
S16T021645			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	46 JNT	TNT
S16T021645			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	73	73 JNT
S16T021645			Decane, 2,3,5,8-tetramethyl-	192823-15-7	7.26	NGS	33 JNT	TN

T - Tentatively Identified Compound Q - Qualitative

NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162141 SDG Number: Customer Sample ID: 16-06172-1-A1 Customer Sample ID: 16-06172-1-A1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err %	Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	J SVOA #2						200001						
S16T021620	3891-98-3	3 2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a l	
S16T021620	95-48-7	2-Methylphenol	NGS	93	<4.9	10	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021620	108-39-4M	M Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021620	92-52-4	Biphenyl	NGS	87	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T021620	78-46-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T021620	84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T021620	112-40-3	Dodecane	NGS	98	<0.60	63	n/a	n/a	n/a	n/a	0.55	n/a	m
S16T021620	544-76-3	Hexadecane-	NGS	95	<3.3	4.6	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021620	629-59-4	Tetradecane	NGS	95	<3.9	7.5	n/a	n/a	n/a	n/a	3.9	n/a	_
S16T021620	126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a QU	2
S16T021620	629-50-5	Tridecane	NGS	90	<1.6	22	n/a	n/a	n/a	n/a	1.6	n/a	
\$16T021620	629-78-7	Heptadecane	NGS	94	<2.4	6.0	n/a	n/a	n/a	n/a	2.4	n/a,	۵
S16T021620	629-62-9	Pentadecane	NGS	96	3.0	7.8	n/a	n/a	n/a	n/a	3.0	n/a	

NA = Not Analyzed, ND = Not Detected

J - Estimated

E - Outside Calibration Range Q - Qualitative

T - Tentatively Identified Compound
U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected

J - Estimated

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141 SDG Number:

	. 1											
Sample# K	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average RPD % Spk	RPD %	Spk Rec %	Det Limit (Det Limit Cot Err % Oual Flans
VAPOR-T	VAPOR-TDU SVOA #2											
S16T021621	3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	nla	n/a	ala	30	-12/11
S16T021621	95-48-7	2-Methylphanol	NOCO	3					100	100	0.0	n/al u
200000000000000000000000000000000000000		z-memylphenol	NGO	Se	<4,9	<4.9	n/a	n/a	n/a	n/a	4.9	. n/a U
1791701910	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a I I
\$161021621	92-52-4	Biphenyl	NGS	87	<4.0	<4.0	n/a	n/a	n/a	n/a	40	n/all
S16T021621	78-46-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a	n/a	20 00	200
S16T021621	84-66-2	Diethylphthalate	NGS	Q	270	770					0.0	- 00
CIETOSIESI	440 40 0					2.0	11/0	11/4	II/d	n/a	7.0	n/a U
0101021021	112-40-3	Dodecane	NGS	98	<0.60	71	n/a	n/a	n/a	n/a	0.55	n/a E
1791701916	544-/6-3	Hexadecane-	NGS	95	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U
\$161021621	629-59-4	Tetradecane	NGS	95	<3.9	5.8	n/a	n/a	n/a	n/a	3.9	n/a J
S16T021621	126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a	n/a	ח	2/2
S16T021621	629-50-5	Tridecane	NGS	90	<1.6	20	n/a	n/a	2/0	2/2	0.0	100
S16T021621	629-78-7	Hentadecane	NOCO	2	5			1000	100	11/0		BAU
2167021621	0.03.003	nepladecare	NGS	94	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a U
170170101	6-70-670	Pentadecane	NGS	96	<3.0	4.7	n/a	n/a	n/a	n/a	30	1 6/0

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162141
SDG Number:
Customer Sample ID: 16-06172-1-B1
Customer Sample ID: 16-06172-1-B1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Oual Flans	hial Flane
VAPOR-TDU SVOA #2	USV	OA #2												
S16T021622		3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	39	n/all	
S16T021622	П	95-48-7	2-Methylphenol	NGS	93	<4.9	<4.9	n/a	n/a	n/a		49	0/2	1
S16T021622		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a		5.6	n/a	-1
S16T021622	П	92-52-4	Biphenyl	NGS	87	44.0	640	n/a	2/2	2	T		100	1
\$16T021622	1	78.46.6	Dibutal butalabasahasata	NOO	2	3				100		4.0	inalo	1
010101011	t	1000	Ciousi outhiniospiloliais	NGO	1,6	<3.0	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U	_
S16T021622		84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a U	
S16T021622		112-40-3	Dodecane	NGS	98	<0.60	92	n/a	n/a	n/a		0.55	n/a E	**
S16T021622		544-76-3	Hexadecane-	NGS	95	<3.3	3.3	n/a	n/a	n/a		3.3	n/a U	
S16T021622		629-59-4	Tetradecane	NGS	95	<3.9	6.2	n/a	n/a	n/a		3.9	n/a	
S16T021622		126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a		5.6	n/a U	
S16T021622		629-50-5	Tridecane	NGS	90	<1.6	26	n/a	n/a	n/a		16	n/a	
S16T021622		629-78-7	Heptadecane	NGS	94	<2.4	2.9	n/a	n/a	n/a		24	n/a l	
S16T021622		629-62-9	Pentadecane	NGS	96	<3.0	5.0	n/a	n/a	n/a		3.0	n/a	

J - Estimated

NA = Not Analyzed, ND = Not Detected

J - Estimated

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Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162141

SDG Number:
Customer Sample ID: 16-06172-1-BLANK
Customer Sample ID: 16-06172-1-BLANK

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Sok Rec %	Dot I imit Co	the along the
VAPOR-TDU SVOA #2	J SVOA #2				CHOICE				10 cm 110		City City of Much Fields
S16T021623	3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	ala	1	20	-/-
S16T021623	95-48-7	2-Methylphenol	NGS	02	440		100	1110	Ī	0.0	D B/U
	00.00	z-wieniyipiidiloi	NGO	93	<4.9	<4.9	n/a	n/a	n/a n/a	4.9	n/a U
\$161021623	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a n/a	ת	n/all
S16T021623	92-52-4	Biphenyl	NGS	87	<40	440	nio	2	T		
SISTONISM	79 46 6						1110	11/0	ind ind	4.0	n/a U
0201201010	0-040-0	Dibutyi butyiphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a n/a	3.6	n/a U
S16T021623	84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a n/a	7.0	n/all
S16T021623	112-40-3	Dodecane	NGS	98	<0.60	0.70	n/a	nía		2	
S16T021623	544-76-3	Hovadacana	NOO	3						0.00	illain
0101021020	O-0-1	nexadecane-	NGS	95	<3.3	<3.3	n/a	n/a	n/a n/a	3.3	n/a U
5161021623	629-59-4	Tetradecane	NGS	95	<3.9	<3.9	n/a	n/a	n/a n/a	3.9	n/a U
S16T021623	126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a n/a	n n	2/2
S16T021623	629-50-5	Tridecane	NGS	90	41.60	4	e/u	2/2		0.0	100
S16T021623	629.78.7	Hantadonano	100	2				100	100	1.0	mao
O IO IOZ IOZO	1-07-670	Heptadecane	NGS	94	<2.4	<2.4	n/a	n/a	n/a n/a	2.4	n/a U
5161021623	629-62-9	Pentadecane	NGS	96	<3.0	<3.0	n/a	n/a	n/a n/a	3.0	n/a U

T - Tentatively Identified Compound
U - Less Than Detection Limit

N - Named TIC

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-C1 Customer Sample ID: 16-06172-1-C1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cott Fre % Oual Flags
VAPOR-TDU SVOA #2	USV	OA #2										0.00	
S16T021624		3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	30	niall
S16T021624		95-48-7	2-Methylphenol	NGS	93	<4.9	<4.9	n/a	n/a	n/a	T	40	n/a U
S16T021624		108-39-4M	Cresol (m & p)	NGS	98	45.6	25.0	2/0	2/2	2/1	T	1.0	
SISTOMESA		03 53 4	District				0.0		ina	11/0	100	0.0	nraio
3101021024		92-52-4	Biphenyi	NGS	87	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U
S16T021624		78-46-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T021624		84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a		7.0	n/a II
S16T021624		112-40-3	Dodecane	NGS	98	<0.60	94	n/a	n/a	n/a		0 55	n/a E
S16T021624		544-76-3	Hexadecane-	NGS	95	<3.3	5.1	n/a	n/a	n/a		20	0/2
S16T021624		629-59-4	Tetradecane	NGS	95	<3.9	8.7	n/a	n/a	n/a	1	39	n/a l
S16T021624		126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a		50	n/a U
S16T021624		629-50-5	Tridecane	NGS	90	<1.6	44	n/a	n/a	n/a		1.6	n/a
S16T021624		629-78-7	Heptadecane	NGS	94	<2.4	5.5	n/a	n/a	n/a	1	2.4	n/a J
S16T021624		629-62-9	Pentadecane	NGS	96	<3.0	10	n/a	n/a	n/a		30	n/a

J - Estimated

NA = Not Analyzed, ND = Not Detected

T - Tentatively Identified Compound
U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected

J - Estimated

Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-D1 Customer Sample ID: 16-06172-1-D1

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD % Spk R	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	NS D	OA #2									0.0000000000000000000000000000000000000	201000000000000000000000000000000000000		
S16T021625		3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/all	
S16T021625	T	95-48-7	2-Methylphenol	NGS	93	<4.9	<4.9	n/a	n/a	n/a		49	n/a l	
S16T021625		108-39-4M	Cresol (m & p)	NGS	98	<5.6	\$5.6	n/a	n/a	n/a		ח מ	n/a	
S16T021625		92-52-4	Biphenyl	NGS	87	<40	640	n/a	ala a	2		4 0	100	1
SCOLOTOLOG	1	1000						100	1110	11/0	pari	4.0	n/a u	
6791701919	T	/8-46-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a l	
S16T021625		84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a		7.0	n/a U	
S16T021625		112-40-3	Dodecane	NGS	98	<0.60	25	n/a	n/a	n/a		0.55	n/a	
S16T021625		544-76-3	Hexadecane-	NGS	95	<3.3	4.2	n/a	n/a	n/a		3.3	n/a	
S16T021625		629-59-4	Tetradecane	NGS	95	<3.9	5.1	n/a	n/a	n/a		3.9	n/a J	
S16T021625		126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a		5.6	n/a U	
S16T021625	Ī	629-50-5	Tridecane	NGS	90	<1.6	7.0	n/a	n/a	n/a		1.6	n/a	
S16T021625		629-78-7	Heptadecane	NGS	94	<2.4	4.8	n/a	n/a	n/a		24	n/a J	
S16T021625		629-62-9	Pentadecane	NGS	96	<3.0	6.5	n/a	n/a	n/a	n/a	3.0	n/a J	

N - Named TIC

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141
SDG Number:
Customer Sample ID: 16-06172-1-E1
Customer Sample ID: 16-06172-1-E1

Sample# R	A# CAS#	#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Fla
VAPOR-TDU SVOA #2	# YOAS	2												
S16T021626	3891	3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	39	n/a	
S16T021626	95-48-7	8-7	2-Methylphenol	NGS	93	<4.9	<4.9	n/a	n/a	n/a	n/a	49	0/2	1
S16T021626	108-	108-39-4M	Cresol (m & p)	NGS	98	<5.6	\$5.6	n/a	n/a	n/a	n/a	n :	2/2	1
S16T021626	92-5	24	Binhany	NOS	07							0.0	11/0	ľ
9791701919	92-52-4	2-4	Biphenyi	NGS	87	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U	
S16T021626	78-46-6	6-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U	7
S16T021626	84-66-2	6-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a L	
S16T021626	112-	12-40-3	Dodecane	NGS	98	<0.60	42	n/a	n/a	n/a	n/a	0.55	n/a	
S16T021626	544-76-3	76-3	Hexadecane-	NGS	95	<3.3	A3.3	n/a	n/a	n/a	n/a	3.3	n/a U	
S16T021626	629-59-4	59-4	Tetradecane	NGS	95	<3.9	4.1	n/a	n/a	n/a	n/a	3.9	n/a l	
S16T021626	126-73-8	73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a	n/a	n/a	56	n/alu	
S16T021626	629-50-5	50-5	Tridecane	NGS	90	<1.6	13	n/a	n/a	n/a	n/a	1.6	0/2	
S16T021626	629-78-7	78-7	Heptadecane	NGS	94	<2.4	<2.4	n/a	n/a	n/a	n/a	24	n/a U	
S16T021626	629-62-9	52-9	Pentadecane	NGS	96	<3.0	4.3	n/a	n/a	n/a	n/a	3.0	n/a l	

NA = Not Analyzed, ND = Not Detected

J - Estimated

C.37

N - Named TIC

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141
SDG Number:
Customer Sample ID: 16-06172-1-EFF-BASE
Customer Sample ID: 16-06172-1-EFF-BASE

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec %		Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	U SVOA #2								The second secon	- 1	
16T021627	3891-98-3	2,6,10-Trimethyldodecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a n/a	3.9	n/alu
16T021627	95-48-7	2-Methylphenol	NGS	93	<4.9	<4.9	n/a	n/a	T		n/a U
16T021627	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a		1	n/a U
16T021627	92-52-4	Biphenyl	NGS	87	<4.0	<4.0	n/a	n/a	T		n/a U
161021627	78-46-6	Dibutyl butylphosphonate	NGS	97	<3.6	<3.6	n/a	n/a			n/a U
16T021627	84-66-2	Diethylphthalate	NGS	91	<7.0	<7.0	n/a	n/a			n/a U
16T021627	112-40-3	Dodecane	NGS	98	<0.60	68	n/a	n/a	n/a n/a		n/a E
16T021627	544-76-3	Hexadecane-	NGS	95	<3.3	^3.3	n/a	n/a			n/a U
16T021627	629-59-4	Tetradecane	NGS	95	<3.9	7.2	n/a	n/a	n/a n/a		n/a J
16T021627	126-73-8	Tributyl phosphate	NGS	93	<5.6	<5.6	n/a	n/a			n/a U
16T021627	629-50-5	Tridecane	NGS	90	<1.6	29	n/a	n/a			n/a
16T021627	629-78-7	Heptadecane	NGS	94	<2.4	2.4	n/a	n/a		N	n/a U
16T021627	629-62-9	Pentadecane	NGS	96	<3.0	6.8	n/a	n/a	n/a n/a	3.0	n/a J

NA = Not Analyzed, ND = Not Detected

J - Estimated

T - Tentatively Identified Compound
U - Less Than Detection Limit

N - Named TIC

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141 SDG Number: Customer Sample ID: 16-06172-1-F1 Customer Sample ID: 16-06172-1-F1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	ec % Det Limit Cnt Err % Qual Flags
VAPOR-TD	VAPOR-TDU SVOA #2									
S16T021628	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	. <3.9	<3.9	n/a	n/a	n/a n	n/a 3.9 n/a
S16T021628	95-48-7	2-Methylphenol	NGS	92	<4.9	¢4.9	n/a	n/a		40
S16T021628	108-39-4M	Cresol (m & p)	NGS	98	<5.6	65.6	n/a	n/a		n
CACAGO	200				0.0	0.0	1880	1170	11 but	1/4 5.0 n/a
\$161021628	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a n	n/a 4.0 n/a
S16T021628	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a n	n/a 3.6 n/a
S16T021628	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a		7.0
S16T021628	112-40-3	Dodecane	NGS	97	<0.55	32	n/a	n/a	n/a n	
S16T021628	544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a n	3.3
S16T021628	629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a		3.9
S16T021628	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a n	n/a 5.6 n/a
S16T021628	629-50-5	Tridecane	NGS	94	<1.6	8.3	n/a	n/a		1.6
S16T021628	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a n	2.4
S16T021628	629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a n	n/a 3.0 n/a

NA = Not Analyzed, ND = Not Detected
J - Estimated

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162141
SDG Number:
Customer Sample ID: 16-06172-1-G1
Customer Sample ID: 16-06172-1-G1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	NS D	OA #2										The second		
S16T021629		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021629		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	
S16T021629		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021629		92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	40	nia	
S16T021629		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	^3 R	n/a	n/o	2/2	2/2	3 0	200	
S16T021629	1	84-66-2	Diethylohthalate	NOS	9	70	270	2/2				0.0	11/0	
	t		and the same	100	5	4.0	17.0	illa	BAU	B/II	B/U	7.0	n/a	
S16T021629		112-40-3	Dodecane	NGS	97	<0.55	33	n/a	n/a	n/a	n/a	0.55	n/a	
S16T021629		544-76-3	Hexadecane-	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021629		629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	
S16T021629		126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	
S16T021629		629-50-5	Tridecane	NGS	94	<1.6	9.3	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021629		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	ľ
S16T021629	F	629-62-9	Pentadecane	NGS	100	<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

N - Named TIC

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141 SDG Number:

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Customer Sample ID: 16-06172-1-H1 Customer Sample ID: 16-06172-1-H1

Sample# R	A# CAS#	Analyte	Unit	% DTS	Blank	Result	Duplicate	Average	RPD % Sok Rec	Spk Rec %	Det Limit	Det Limit Cot Err % Qual Flags
VAPOR-TDU SVOA #2	U SVOA #2						2000	,			1000	
S16T021630	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	30	n/a
S16T021630	95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	2/0	40	n/o
S16T021630	108-39-4M	Cresol (m & p)	NGS	98	×5 6	A. 7. 7.	n/o	2/2	2/2	3/0	n .	100
CASTONASO	00 60	2			0,0	0.0	2000	in a	11/0	PAI	0.0	B/U
3161021630	92-52-4	Biphenyl	NGS	97	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a
S16T021630	78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a
S16T021630	84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021630	112-40-3	Dodecane	NGS	97	<0.55	43	n/a	n/a	n/a	n/a	0.55	n/a
S16T021630	544-76-3	Hexadecane-	NGS	94	3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021630	629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021630	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021630	629-50-5	Tridecane	NGS	94	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a
S16T021630	629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021630	629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a

NA = Not Analyzed, ND = Not Detected

J - Estimated

E - Outside Calibration Range Q - Qualitative

T - Tentatively Identified Compound
U - Less Than Detection Limit

N - Named TIC

J - Estimated

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141 SDG Number: Customer Sample ID: 16-06172-1-H2 Customer Sample ID: 16-06172-1-H2

Sample# R	A#	CAS#	Analyte	Unit	% OTTS	Blank	Result	Dunlicate	Augrana	% Caa	0-1-0-0/	Park I look	
VAPOR-TDU SVOA #2	VS UC	OA #2								[about not to		City City City College
S16T021631	-	3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	30	2/2
S16T021631		95-48-7	2-Methylphenol	NGS	92	44.9	64.9	n/a	nla	2/2	T		ina
S16T021631	1	108-30-AM	Cocci (m g n)	100	3			-		ind	11/0	4.5	IVA
1591701919	t	108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021631		92-52-4	Biphenyl	NGS	97	<4.0	4.0	n/a	n/a	n/a		40	n/o
S16T021631		78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	38	n/a	2/2	2		3 6	100
SISTOMER	1	0 22 40					1		1110	11/0	DAI.	0.0	II/8
1001771010	T	04-00-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021631		112-40-3	Dodecane	NGS	97	<0.55	33	n/a	n/a	n/a		0.55	n/a
S16T021631		544-76-3	Hexadecane-	NGS	94	<3.3	33	n/a	n/a	nla		20	n/o
S16T021631		629-59-4	Tetradecane	NGS	100	130	130	260					
CACTOOLOOL	1	100			-	0.0	0.0	200	DAIL	III	BAIL	3.8	n/a
1591201918	t	126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021631		629-50-5	Tridecane	NGS	94	<1.6	9.5	n/a	n/a	n/a		1 5	n/a l
S16T021631		629-78-7	Heptadecane	NGS	91	<2.4	<2.4	n/a	n/a	n/a		24	0/2
S16T021631		629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a		30 !	2/2

NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162141
SDG Number:
Customer Sample ID: 16-06172-1-IN-BASE
Customer Sample ID: 16-06172-1-IN-BASE

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk R	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	VS U	OA #2										0.000	
S16T021632		3891-98-3	2,6,10-Trimethyldodecane	NGS	98	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a
S16T021632		95-48-7	2-Methylphenol	NGS	92	<4.9	<4.9	n/a	n/a	n/a	n/a	49	n/a
S16T021632		108-39-4M	Cresol (m & p)	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	J. 10	n/a
S16T021632		92-52-4	Biphenyl	NGS	97	<40	40	n/a	nio	2/2	2/2	400	nice of
S16T021632		78-46-6	Dibutyl butylphosphonate	NGS	00	<3.6	^3 6	n/a	n/a	n/a	n/a	20 0	2/2
CERTODIASS	1	C 33 VB	Distribution		3				1			0.0	100
2001021002	T	2-00-40	Diemyphinalate	NGO	08	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a
S16T021632	Г	112-40-3	Dodecane	NGS	97	<0.55	65	n/a	n/a	n/a	n/a	0.55	n/a E
S16T021632		544-76-3	Hexadecane-	NGS	94	<3.3	3.4	n/a	n/a	n/a	n/a	3.3	n/a J
S16T021632		629-59-4	Tetradecane	NGS	100	<3.9	5.1	n/a	n/a	n/a	n/a	3.9	n/a J
S16T021632		126-73-8	Tributyl phosphate	NGS	99	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a
S16T021632		629-50-5	Tridecane	NGS	94	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a
S16T021632		629-78-7	Heptadecane	NGS	91	<2.4	3.4	n/a	n/a	n/a	n/a	2.4	n/a J
S16T021632		629-62-9	Pentadecane	NGS	100	<3.0	6.8	n/a	n/a	n/a	n/a	3.0	n/a J

J - Estimated

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-A1

Sample# R A# QC Type Analyte CAS No. (Minutes) Unit Result		
	* *	Unit
	THE CONTRACT OF THE CONTRACT O	

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flags
VAPOR-TDU SVOA #2	SVOA #	2						and in the
S16T021620			Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	290 JNT	TNL
S16T021620			Phenol	108-95-2	4.45	NGS	34	34 JNT
S16T021620			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	51	51 JNT
S16T021620			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	87	87 JNT
S16T021620			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	36	36 JNT
S16T021620			Acetophenone	98-86-2	5.19	NGS	39	39 JNT
S16T021620			Unknown-1		5.38	NGS	50 JT	JT
S16T021620			Undecane	1120-21-4	5.45	NGS	160 JNT	JNT
S16T021620			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	130 JNT	JNT
S16T021620			Undecane, 3-methyl-	1002-43-3	6.05	NGS	7.8	7.8 JNT
S16T021620			Ethanol, 2-phenoxy-	122-99-6	6.56	NGS	66	TNL 89
S16T021620			Benzothiazole	95-16-9	6.61	NGS	50	50 JNT
S16T021620			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	52	52 JNT
S16T021620			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	13	13 JNT
S16T021620			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	58.	58 JNT
S16T021620			Dodecane,4,6-dimethyl	61141-72-8	7.27	NGS	37	37 JNT
S16T021620			Propanoic acid, 2-methyl-, 1-(74381-40-1	920	NOS	71 JNT	INT

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

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

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-A2
Customer Sample ID: 16-06172-1-A2

Sample# R	Α#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021621			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	200 JNT	JNT
S16T021621			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	26	26 JNT
S16T021621			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	70	70 JNT
S16T021621			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	25	25 JNT
S16T021621			Acetophenone	98-86-2	5.19	NGS	21	21 JNT
S16T021621			Undecane	1120-21-4	5.45	NGS	150 JNT	JNT
S16T021621			Hydroxylamine, O-decyl-	29812-79-1	5.50	NGS	26	26 JNT
S16T021621			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	120 JNT	JNT
S16T021621			Undecane, 3-methyl-	1002-43-3	6.05	NGS	1	11 JNT
S16T021621			Undecane, 2,6-dimethyl-	17301-23-4	6.40	NGS	5.4 JNT	JNT
S16T021621			Benzolhiazole	95-16-9	6.61	NGS	75	75 JNT
S16T021621			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	TNL 09	JNT
S16T021621			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	14	14 JNT
S16T021621			Undecane, 3,7-dimethyl-	17301-29-0	7.01	NGS	16	16 JNT
S16T021621			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	41 JNT	JUL
S16T021621			Dodecane,4,6-dimethyl	61141-72-8	7.26	NGS	45 JNT	TNI

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-B1 Customer Sample ID: 16-06172-1-B1

Sample# R	A.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flags
VAPOR-TDU SVOA #2	SVOA	#2						Section 1
S16T021622			Propanoic acid, 2,2-dimethyl-	75-98-9	3.16	NGS	32	32 JNT
S16T021622			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	230 JNT	JUT
S16T021622			Isooctanol	26952-21-6	4.84	NGS	51 JNT	TN
S16T021622			1-Heptanol, 2,4-dimethyl-, (2S	18450-74-3	4.87	NGS	49 JNT	TIN
S16T021622			1-Heptanol, 6-methyl-	1653-40-3	4.90	NGS	37 JNT	JUL
S16T021622			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	1NL 06	TNI
S16T021622			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	28 JNT	TN
S16T021622			Acetophenone	98-86-2	5.19	NGS	29 JNT	TN
S16T021622			Hexyl octyl ether	17071-54-4	5,39	NGS	43 JNT	JNT
S16T021622			Undecane	1120-21-4	5.45	NGS	210 JNT	TNI
S16T021622			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	110 JNT	TNT
S16T021622			Undecane, 2,6-dimethyl-	17301-23-4	6.41	NGS	6.8 JNT	TNI
S16T021622			1,2-Benzisothiazole	272-16-2	6.62	NGS	82 JNT	TNI
S16T021622			Ethylene diacrylate	2274-11-5	6.68	NGS	32 JNT	TNI
S16T021622			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.91	NGS	53 JNT	JNT
S16T021622			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	TNL E1	JUT
S16T021622			Undecane, 3,7-dimethyl-	17301-29-0	7.02	NGS	14 JNT	TNI
S16T021622			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	48 JNT	JNT
S16T021622			Dodecane,4,6-dimethyl	61141-72-8	7.27	NGS	46 JNT	TNI

E - Outside Calibration Range
J - Estimated

T - Tentatively Identified Compound
Q - Qualitative

U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-C1

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	Customer Sample ID: 16-06172-1-C1	
	_	
Retention Time		

Sample# R A	A# QC Type	ype Analyte	î î	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flans
VAPOR-TDU SVOA #2	OA #2	-				-	Tipopit,	was ridge
S16T021624		Prop	Propanoic acid, 2,2-dimethyl-	75-98-9	3.15	NGS	31	31 JNT
S16T021624		Cycle	Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	230 JNT	TINI
S16T021624		1-Не	-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	33 JNT	TNL
S16T021624		Deca	Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	71	71 JNT
S16T021624		Deca	Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	25	25 JNT
S16T021624		Acet	Acetophenone	98-86-2	5.19	NGS	31 JNT	TNL
S16T021624		Hexy	Hexyl octyl ether	17071-54-4	5.39	NGS	27	27 JNT
S16T021624		Unde	Undecane	1120-21-4	5.45	NGS	150 JNT	JUT
S16T021624		Deca	Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	TNL 86	JUT
S16T021624		Unde	Undecane, 3-methyl-	1002-43-3	6.05	NGS	1NL 9.9	JUL
S16T021624		Benz	Benzothiazole	95-16-9	6.62	NGS	71	71 JNT
S16T021624		Dode	Dodecane, 2,7,10-trimethyl-	74645-98-0	6.91	NGS	46 JNT	JNT
S16T021624		Dode	Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	12	12 JNT
S16T021624		Unde	Undecane, 3,7-dimethyl-	17301-29-0	7.02	NGS	10	10 JNT
S16T021624		Dode	Dodecamethylcyclohexasiloxane	540-97-6	7.08	NGS	45 JNT	JUL
S16T021624		Dode	Dodecane,4,6-dimethyl	61141-72-8	7.27	NGS	38 JNT	TNI

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-D1 Customer Sample ID: 16-06172-1-D1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	NOA	#2				Ī		
S16T021625			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	190 JNT	TN
S16T021625			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	TNL 05	TN
S16T021625			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	19 JNT	TN
S16T021625			Acetophenone	98-86-2	5.18	NGS	27 JNT	TN
S16T021625			Undecane	1120-21-4	5.45	NGS	94 JNT	TN
S16T021625			Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	16 JNT	TN
S16T021625			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	100 JNT	TN
S16T021625			Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.0 JNT	TN
S16T021625			Dodecane, 2,7,10-trimethyl-	74645-98-0	6.90	NGS	29 JNT	TN
S16T021625			Dodecane, 2,6,11-triemthyl-	31295-56-4	6.96	NGS	6.2 JNT	INT
S16T021625			Dodecane,4,6-dimethyl	61141-72-8	7.26	NGS	16 JNT	TN

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

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

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-E1
Customer Sample ID: 16-06172-1-E1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						9
S16T021626			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	180	BO JNT
S16T021626			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	28	28 JNT
S16T021626			3,3-Dimethylhexane	563-16-6	4.88	NGS	37	37 JNT
S16T021626			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS .	63	63 JNT
S16T021626			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	20	20 JNT
S16T021626			Acetophenone	98-86-2	5.18	NGS	24	24 JNT
S16T021626			Undecane	1120-21-4	5.45	NGS	120	120 JNT
S16T021626			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	120 JNT	JNT
S16T021626			Undecane, 2-methyl-	7045-71-8	6.00	NGS	5.5 JNT	JNT
S16T021626			Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.2 JNT	JNT
S16T021626			Benzothiazole	95-16-9	6.60	NGS	69	TNL 69
S16T021626			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	41	41 JNT
S16T021626		16	Dodecane, 2,6,11-trimethyl-	31295-56-4	6.96	NGS	9.3 JNT	JNT
S16T021626			Undecane, 3,7-dimethyl-	17301-29-0	7.01	NGS	9.8 JNT	JNT
S16T021626			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	45	45 JNT
\$16T021626			Dodecane,4,6-dimethyl	61141-72-8	7.26	NGS	28 JNT	TNL

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

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

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-EFF-BASE
Customer Sample ID: 16-06172-1-EFF-BASE

Sample# R	Α#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	NOA	#2					1100001	ego: room
S16T021627			3-Methoxy-3-methylbutanol	56539-66-3	3.92	NGS	36	36 JNT
S16T021627			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	200 JNT	TNL
S16T021627			2,2,7,7-Tetramethyloctane	1071-31-4	4.49	NGS	65	TNL 59
S16T021627			Nonane, 2,2,3-trimethyl-	55499-04-2	4.77	NGS	28	28 JNT
S16T021627			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	68	TNL 88
S16T021627			Octane, 2,3,6,7-tetramethyl-	52670-34-5	4.89	NGS	93	93 JNT
S16T021627			Octane, 3,5-dimethyl-	15869-93-9	5.06	NGS	85	85 JNT
S16T021627			Decane, 2,5,9-trimethyl-	62108-22-9	5.14	NGS	37	37 JNT
S16T021627			Acetophenone	98-86-2	5.19	NGS	==	11 JNT
S16T021627			2,6-Dimethyldecane	13150-81-7	5.25	NGS	59	TNL 69
S16T021627			Undecane	1120-21-4	5.45	NGS	120 JNT	JNT
S16T021627			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	83	83 JNT
S16T021627			Benzothiazole	95-16-9	6.61	NGS	40	40 JNT
S16T021627			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	29	29 JNT
S16T021627			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	26	26 JNT
S16T021627			Dodecane, 2,6,11-trimethyl-	31295-56-4	7.26	NGS	24	24 JNT
S16T021627			Undecane, 2-methyl-	7045-71-8	7.33	NGS	9.5 JNT	TNI

NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-F1
Customer Sample ID: 16-06172-1-F1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flans
VAPOR-TDU SVOA #2	SVOA	#2						in the second
S16T021628			Unknown-1		4.35	NGS	110 J	٦
S16T021628			2,6-Dimethyldecane	13150-81-7	5.06	NGS	32 JNT	TN
S16T021628			Acetophenone	98-86-2	5.18	NGS	16	TNL 91
S16T021628			Undecane	1120-21-4	5.44	NGS	73 JNT	TN
S16T021628			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	67 JNI	TNI
S16T021628			Benzothiazole	95-16-9	6.60	NGS	41 JNT	TN
S16T021628			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	22 JN1	TN

Sample Group: 20162141

SDG Number:

Customer Sample ID: 16-06172-1-G1

Data Summary of All Results Cartridge Evaluation

\$16T021629 \$16T021629 S16T021629 S16T021629 S16T021629 S16T021629 S16T021629 S16T021629 VAPOR-TDU SVOA #2 Customer Sample ID: 16-06172-1-G1 R A# QC Type Analyte Dodecane, 2,6,11-trimethyl-Benzothiazole Decamethlycyclopentasiloxane Unknown-1 Undecane Acetophenone Decane, 3,7-dimethyl-Methenamine 1120-21-4 541-02-6 95-16-9 31295-56-4 98-86-2 17312-54-8 100-97-0 CAS No. Retention Time (Minutes) 5.45 6.90 6.59 5.18 5.05 6.66 4.35 NGS NGS NGS NGS NGS NGS Unit 110 JNT 31 JNT 18 JNT 34 JNT 77 JNT 35 JNT 12 JNT 130 JT Qual Flags

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162141 SDG Number: Customer Sample ID: 16-06172-1-H1
Customer Sample ID: 16-06172-1-H1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flans
VAPOR-TDU SVOA #2	SVOA	#2					, mooni	2007
S16T021630			Unknown-1	7	4,35	NGS	220 JT	П
S16T021630			Phenol	108-95-2	4.42	NGS	30	TNL
S16T021630			1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	29 JI	TNL
S16T021630			Acetophenone	98-86-2	5.18	NGS		TN
S16T021630			Undecane	1120-21-4	5.45	NGS	100 JNT	TN
S16T021630			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	88	INC
S16T021630			Benzothiazole	95-16-9	6.60	NGS	45 JNT	TN
S16T021630			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	25 JNT	TN
S16T021630			2,2,4-Trimethyl-1,3-pentanedio	6846-50-0	9.18	NGS	26 JUT	TIN

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range
J - Estimated

U - Less Than Detection Limit

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

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-H2
Customer Sample ID: 16-06172-1-H2

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T021631			Unknown-1		4.35	NGS	J 86	JT
S16T021631			Acetophenone	98-86-2	5.19	NGS	11 JN	TN
S16T021631			Undecane	1120-21-4	5.45	NGS	05 JN	TNI
S16T021631			Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	14 JNT	TNT
S16T021631			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	79 JN	TN
S16T021631			Benzothiazole	95-16-9	6.60	NGS	37 JN	TN
S16T021631			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	19 JN	TN

T - Tentatively Identified Compound
Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

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

Sample Group: 20162141 SDG Number:

Customer Sample ID: 16-06172-1-IN-BASE
Customer Sample ID: 16-06172-1-IN-BASE

Sample# R A#	# QC	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2)A #2							
S16T021632			2-Butoxyethanol	111-76-2	3.71	NGS	17	17 JUT
S16T021632			Unknown-1		4.35	NGS	370 JT	JT
S16T021632			Phenol	108-95-2	4.43	NGS	31	31 JNT
S16T021632			Unknown-2		4.84	NGS	46 JT	77
S16T021632			Methyltris(trimethylsiloxy)sil	17928-28-8	5.00	NGS	27	27 JNT
S16T021632			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	67	67 JNT
S16T021632			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	23	23 JNT
S16T021632			Acetophenone	98-86-2	5.19	NGS	19	19 JNT
S16T021632			Undecane	1120-21-4	5.45	NGS	150 JNT	JNT
S16T021632			Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	20 JNT	JNT
S16T021632			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	150 JNT	JNT
S16T021632			Benzothiazole	95-16-9	6.62	NGS	81 JNT	JNT
S16T021632			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	49 JNT	JNT
S16T021632			Dodecamethylcyclohexasiloxane	540-97-6	7.08	NGS	71 JNT	TNT
S16T021632			Undecane, 3,7-dimethyl-	17301-29-0	7.27	NGS	35 JNT	JNT
S16T021632			2,2,4-Trimethyl-1,3-pentanedio	6846-50-0	9.18	NGS	28 JNT	TNI

T - Tentatively Identified Compound Q - Qualitative

E - Outside Calibration Range J - Estimated

U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected

C.3.2 **VOC and VOCTIC**

N - Named TIC

Y - Comment

Benzene

S16T021648 S16T021648 S16T021648 S16T021648 71-43-2 107-18-6 107-13-1 107-05-1 Allyl Alcohol Allyl Chloride Acrylonitrile Acetophenone

S16T021648

98-86-2

NGS NGS

100 100 100

<1.5 ₹2.3 2 <6.2 <2.8 €2.2 <2.6 43.3 <2.7

8 22

<2.3

75-05-8

Acetonitrile

67-64-1

Acetone

S16T021648 S16T021648 S16T021648 S16T021648 S16T021648 S16T021648 S16T021648 S16T021648

16T021648

105-42-0

106-68-3

108-10-1

4-Methyl-2-Pentanone 4-Methyl-2-hexanone 3-Octanone

NGS

NGS

86

2.7E+03

n/a n/a n/a n/a n/a n/a n/a n/a n/a

2.8

FY

1.6

€2.2 <2.6 43.3

41.6

280

10

n/a n/a

n/a n/a n/a n/a n/a

n/a

n/a n/a n/a n/a n/a n/a n/a n/a n/a

장

2.5

п/a n/a n/a

r/a J

NGS

NGS

99

Q - Qualitative J - Estimated

SDG Number: Customer Sample ID: 16-06172-2-A1 71-23-8 75-34-3 591-78-6 110-43-0 71-36-3 123-91-1 106-46-7 542-75-6 107-06-2 75-35-4 78-93-3 08-47-4 111-70-6 708-29-8 2-Hexanone 2,4-Dimethylpyridine 1,1-Dichloroethane 2-Heptanone 2-Butanone 2,5-Dihydrofuran 1-Heptanol 1,4-Dioxane 1,3-Dichloropropene (Total) 1,1-Dichloroethene 1-Propanol 1-Butanol 1,4-Dichlorobenzene 1,2-Dichloroethane NGS NGS NGS SSN SSN SBN NGS NGS NGS NGS

> 6 8

> > 41.8 41.7 41.7

4.1

4.1

n/a

n/a n/a n/a

Ма n/a n/a

n/a

3.8

n/a

99

100

93

S16T021648

16T021648

16T021648

100

<2.2 4.1 110 69.1 310

n/a

n/a

4 8.9 9.1 4.3 2.0

n/a

n/a

n/a

270

n/a n/a n/a

n/a n/a n/a n/a n/a n/a n/a n/a n/a

n/a n/a n/a n/a n/a n/a n/a n/a n/a

n/a

n/a

9.4

16

S16T021648 S16T021648

16T021648

16T021648

534-22-5

106-35-4 78-94-4

> 3-Buten-2-one 2-Methylfuran

3-Heptanone

NGS

100

93 96

<1.9

6.6

n/a

n/a

1.9 2.5

1.3

n/a n/a

n/a n/a

n/a

55

n/a

n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a

3.3

1.3 42.5 <2.6 3 <2.2 4.1 <8.9 69.1 <4.3 2.0

<1.3

NGS

NGS

96

S16T021648 S16T021648 S16T021648 S16T021648 S16T021648

S16T021648

Cartridge Evaluation
Data Summary of All Results

19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b

DSR.Jar v. 3.0.12

Sample Group: 20162143

Cus	ton	er Sample	Customer Sample ID: 16-06172-2-A1											
Sample# R	A#	R A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate Average RPD % SI	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2	8	A #2												
S16T021648		79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n∕a	n/a	n/a	n/a	3.0	n/a	
S16T021648		79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	

NA = Not Analyzed, ND = Not Detected

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L - LLS Outside Range

E - Outside Calibration Range
T - Tentatively Identified Compound

Page: 1

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-A1
Customer Sample ID: 16-06172-2-A1

Sample# R	A#	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Result Duplicate Average RPD % Spk Rec %	- 1	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	U VC)A #2												
S16T021648	П	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a		4.2	n/a	
S16T021648	П	123-72-8	Butanal	NGS	100	<3.0	22	n/a	n/a	n/a	n/a	3.0	n/a	
S16T021648	П	109-74-0	Butanenitrile	NGS	110	<2.1	38	n/a	n/a	n/a		2.1	n/a	
S16T021648		56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a		1.5	n/a	
S16T021648	Π	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a		2.5	n/a	
S16T021648		75-00-3	Chloroethane	NGS	110	<1.6	2.1	n/a	n/a	n/a		1.6	n/a J	
S16T021648		67-66-3	Chloroform	NGS	100	<1.8	7.3	n/a	n/a	n/a		1.8	n/a J	
S16T021648		110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a		1.4	n/a	
S16T021648		124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a		3.3	n/a	
S16T021648	_	64-17-5	Ethanol	NGS	100	3.8	230	n/a	n/a	n/a		3.7	n/a B	
S16T021648	Г	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a		1.8	n/a	
S16T021648	Г	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a		2.4	n/a	
S16T021648	Т		Furan	NGS	95	<1.6	5.0	n/a	n/a	n/a		1.6	n/a J	
S16T021648	Г	110-54-3	Hexane	NGS	96	<1.3	38	n/a	n/a	n/a		1.3	n/a	
S16T021648	Г	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a		2.6	n/a	
S16T021648	Т	126-98-7	Methacrylonitrile	NGS	110	<1.8	5.8	n/a	n/a	n/a		1.8	r/a J	
S16T021648	Г	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a		4.1	n/a	
S16T021648	Г	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a		5.3	n/a	
S16T021648	Г	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a		4.7	n/a	
S16T021648	T	110-59-8	Pentanenitrile	NGS	110	<2.6	12	n/a	n/a	n/a		2.6	r/a J	
S16T021648	T	107-12-0	Propanenitrile	NGS	100	<1.8	33	n/a	n/a	n/a		1.8	n/a	
S16T021648	T	110-86-1	Pyridine	NGS	100	<2.8	20	n/a	n/a	n/a		2.8	n/a L	
S16T021648	T		Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
S16T021648	T	127-18-4	Tetrachloroethene	NGS	100	<1.8	44	n/a	n/a	n/a		1.8	n/a	
S16T021648	Г	108-88-3	Toluene	NGS	110	<2.2	9.8	n/a	n/a	n/a		2.2	n/a J	
S16T021648	T	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a		1.6	n/a	
S16T021648	T	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	450	n/a	n/a	n/a	1	1.9	n/a E	
S16T021648		10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8	n/a	
S16T021648	Т	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a		2.4	n/a	

Q - Qualitative
J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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L - LLS Outside Range

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Data Summary of All Results Cartridge Evaluation 19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample# R A# CAS# Sample Group: 20162143 VAPOR-TDU VOA #2 SDG Number: Customer Sample ID: 16-06172-2-A1 Customer Sample ID: 16-06172-2-A1 142-82-5 Analyte n-Heptane NGS NGS Unit STD % 100 Blank <1.6 <2.1 Result Duplicate 19 <2.1 Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags n/a n/a n/a

S16T021648 S16T021648

10061-02-6 trans-1,3-Dichloropropene

n/a

Page: 3

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-A2
Customer Sample ID: 16-06172-2-A2

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	pk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2											
S16T021649	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	nía
S16T021649	79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a
S16T021649	75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021649	75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021649	107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021649	542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021649	106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021649	123-91-1	1,4-Dioxane	NGS	99	<2.0	2.0	n/a	n/a	n/a	n/a	2.0	n/a
S16T021649	71-36-3	1-Butanol	NGS	110	<4.3	7.2	n/a	n/a	n/a	n/a	4.3	n/a J
S16T021649	111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a
S16T021649	71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a
S16T021649	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n∕a	n/a	n/a	n/a	4.1	n/a
S16T021649	1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021649	78-93-3	2-Butanone	NGS	96	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a
S16T021649	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021649	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021649	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021649	78-94-4	3-Buten-2-one	NGS	93	<1.9	<1.9	n/a	n/a	n/a	π/a	1.9	n/a
S16T021649	106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021649	106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021649	105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	- n/a	n/a	n/a	n/a	2.6	n/a
S16T021649	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
S16T021649	67-64-1	Acetone	NGS	86	<2.8	20	n/a	n/a	n/a	n/a	2.8	n/a
S16T021649	75-05-8	Acetonitrile	NGS	100	<1.6	97	n/a	n/a	n/a	n/a	1.6	n/a
S16T021649	98-86-2	Acetophenone	NGS	100	<6.2	9.6	n/a	n/a	n/a	n/a	6.2	n/a J
S16T021649	107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021649	107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a
S16T021649	107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021649	71-43-2	Benzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a

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B - Blank Contamination L - LLS Outside Range

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-A2 Customer Sample ID: 16-06172-2-A2

n/a	2.4	n/a	n/a	n/a	n/a	<2.4	<2.4	93	NGS	n-Butyl acetate	123-86-4	S16T021649
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	cis-1,3-Dichloropropene	10061-01-5	S16T021649
n/a J	1.9	n/a	n/a	n/a	n/a	5.7	<1.9	98	NGS	Trichlorofluoromethane	75-69-4	S16T021649
n/a	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	100	NGS	Trichloroethene	79-01-6	S16T021649
n/a J	2.2	n/a	n/a	n/a	n/a	3.3	<2.2	110	NGS	Toluene	108-88-3	S16T021649
n/a	1.8	n/a	n/a	n/a	n/a	130	<1.8	100	NGS	Tetrachioroethene	127-18-4	S16T021649
n/a	2.7	n/a .	n/a	n/a	n/a	<2.7	<2.7	110	NGS	Styrene	100-42-5	S16T021649
n/a L	2.8	n/a	n/a	n/a	n/a	<2.8	<2.8	100	NGS	Pyridine	110-86-1	S16T021649
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	Propanenitrile	107-12-0	S16T021649
n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	110	NGS	Pentanenitrile	110-59-8	S16T021649
n/a	4.7	n/a	n/a	n/a	n/a	<4.7	<4.7	94	NGS	Nitrobenzene	98-95-3	S16T021649
n/a	5.3	n/a	n/a	n/a	n/a	<5.3	<5.3	110	NGS	Naphthalene	91-20-3	S16T021649
n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	Methylene Chloride	75-09-2	S16T021649
n/a J	1.8	n/a	n/a	n/a	n/a	3.5	<1.8	110	NGS	Methacrylonitrile	126-98-7	S16T021649
n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	100	NGS	Hexanenitrile	628-73-9	S16T021649
n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	Hexane	110-54-3	S16T021649
n/a	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	95	NGS	Furan	110-00-9	S16T021649
n/a	2.4	n/a	n/a	n/a	e/u	<2.4	<2.4	110	NGS	Ethylbenzene	100-41-4	S16T021649
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	98	NGS	Ethyl acetate	141-78-6	S16T021649
n/a BJ	3.7	n/a	n/a	n/a	n/a	17	3.8	100	NGS	Ethanol	64-17-5	S16T021649
n/a	3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	100	NGS	Decane	124-18-5	S16T021649
n/a	1.4	n/a	n/a	n/a	n/a	<1.4	<1.4	99	NGS	Cyclohexane	110-82-7	S16T021649
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	Chloroform	67-66-3	S16T021649
n/a J	1.6	n/a	n/a	n/a	n/a	2.1	<1.6	110	NGS	Chloroethane	75-00-3	S16T021649
n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	110	NGS	Chlorobenzene	108-90-7	16T021649
n/a	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	100	NGS	Carbon tetrachloride	56-23-5	S16T021649
n/a	2.1	n/a	n/a	n/a	n/a	<2.1	2.1	110	NGS	Butanenitrile	109-74-0	S16T021649
n/a	3.0	n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	Butanal	123-72-8	S16T021649
n/a	4.2	n/a	n/a	n/a	n/a	<4.2	<4.2	100	NGS	Benzonitrile	100-47-0	S16T021649
											VOA #2	VAPOR-TDU VOA #2
Det Limit Cnt Err % Qual Flags	Det Limit	Average RPD % Spk Rec %	RPD %	Average	Result Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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

C.60

Q - Qualitative J - Estimated

2 8

E - Outside Calibration Range
T - Tentatively Identified Compound

Calibration Dance

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination L - LLS Outside Range Cartridge Evaluation
Data Summary of All Results

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VAPOR-TDU VOA #2
S16T0Z1649 1142-82-5 n-Heptane NGS 110 <1.6 <1.6 n/a n/a n/a n/a n/a 1.6 n/a
\$16T021649 10061-02-6 trans-1 3-Dichloropropose NGS 100 221 221

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-B1 Customer Sample ID: 16-06172-2-B1

		Control of the contro									1000	7	
Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate Average RPD % Spk R	Average	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ıal Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T021650	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	
S16T021650	79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
S16T021650	75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021650	75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021650	107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021650	542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021650	106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021650	123-91-1	1,4-Dioxane	NGS	99	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	
S16T021650	71-36-3	1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	
S16T021650	111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	
S16T021650	71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	
S16T021650	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021650	1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	
S16T021650	78-93-3	2-Butanone	NGS	96	<3.1	3.2	n/a	n/a	n/a	n/a	3.1	n/a J	
S16T021650	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	'n/a	n/a	n/a	n/a	2.6	n/a	
S16T021650	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021650	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	
S16T021650	78-94-4	3-Buten-2-one	NGS .	93	<1.9	2.3	n/a	n/a	n/a	n/a	1.9	n/a J	
S16T021650	106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
S16T021650	106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021650	105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021650	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	
S16T021650	67-64-1	Acetone	NGS	86	<2.8	74	n/a	n/a	n/a	n/a	2.8	n/a	
S16T021650	75-05-8	Acetonitrile	NGS	100	<1.6	300	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021650	98-86-2	Acetophenone	NGS	100	<6.2	14	n/a	n/a	n/a	n/a	6.2	n/a	
S16T021650	107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
S16T021650	107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
S16T021650	107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021650	71-43-2	Benzene	NGS	110	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	n/a J	

NA = Not Analyzed, ND = Not Detected

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

C.62

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-B1 Customer Sample ID: 16-06172-2-B1

Sample# R	ğ	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	5	A #2											
S16T021650		100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021650		123-72-8	Butanal	NGS	100	<3.0	3.2	n/a	n/a	n/a	n/a	3.0	n/a J
S16T021650		109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021650		56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S16T021650		108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021650		75-00-3	Chloroethane	NGS	110	<1.6	2.8	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021650		67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021650		110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
S16T021650		124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021650		64-17-5	Ethanol	NGS	100	3.8	81	n/a	n/a	n/a	n/a	3.7	n/a B
S16T021650		141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021650		100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021650		110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021650		110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021650		628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021650		126-98-7	Methacrylonitrile	NGS	110	<1.8	5.6	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021650		75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n∕a	4.1	n/a
S16T021650		91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021650		98-95-3	Nitrobenzene	NGS	94	<4.7	11	n/a	n/a	n/a	n/a	4.7	n/a J
S16T021650		110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021650		107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021650		110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021650		100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021650		127-18-4	Tetrachloroethene	NGS	100	<1.8	100	n/a	n/a	n/a	n/a	1.8	n/a
S16T021650		108-88-3	Toluene	NGS	110	<2.2	3.2	n/a	n/a	n/a	n/a	2.2	n/a J
S16T021650		79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021650		75-69-4	Trichlorofluoromethane	NGS	98	<1.9	92	n/a	n/a	n/a	n/a	1.9	n/a
S16T021650		10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021650		123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	.2.4	n/a

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range
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N - Named TIC Y - Comment

Q - Qualitative J - Estimated

B - Blank Contamination L - LLS Outside Range

Q - Qualitative J - Estimated

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E - Outside Calibration Range
T - Tentatively Identified Compound

Calibration Range

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination
L - LLS Outside Range

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162143

S16T021650 S16T021650 Sample# R A# CAS# VAPOR-TDU VOA #2 SDG Number: Customer Sample ID: 16-06172-2-B1 Customer Sample ID: 16-06172-2-B1 10061-02-6 trans-1,3-Dichloropropene 142-82-5 Analyte n-Heptane NGS NGS Unit STD % 100 Blank <1.6 Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags <1.6 <2.1 n/a n/a n/a n/a n/a

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-BLANK Customer Sample ID: 16-06172-2-BLANK

R	n/a		n/a	n/a	n/a	n/a	<1.5	<1.5	110	NGS	Benzene	71-43-2	S16T021651
R Ad CAS Analyte Dunit STD Blank Result Duplicato Avarago RPD Spk Rec 9 P3-34-5 1,1,2,2-Ticrlochloroethane NGS 100 <2,3 <2,3 n/a	Vа		n/a	n/a	n/a	n/a	<2.5	<2.5	99	NGS	Allyl Chloride	107-05-1	S16T021651
TRU July Tru Tru	Va		n/a	n/a	n/a	n/a	<2.3	<2.3	96	NGS	Allyl Alcohol	107-18-6	S16T021651
R AB CAS# Analyne Lint STD, Blank Result Duplicate Average RPD % Spk Rec %	νa		n/a	n/a	n/a	n/a	2.1	<2.1	100	NGS	Acrylonitrile	107-13-1	S16T021651
CAS # Analyte	Va Q		n/a	n/a	n/a	n/a	<6.2	<6.2	100	NGS	Acetophenone	98-86-2	S16T021651
Product Prod	ν/a		n/a	n/a	n/a	n/a	71	<1.6	100	NGS	Acetonitrile	75-05-8	S16T021651
CAS Ambyte Amby	Va		n/a	n/a	n/a	n/a	<2.8	<2.8	86	NGS	Acetone	67-64-1	S16T021651
CAS # Analyke	V/a		n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	4-Methyl-2-Pentanone	108-10-1	S16T021651
	ν/a Q		n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	4-Methyl-2-hexanone	105-42-0	S16T021651
	1/a Q		n/a	n/a	n/a	n/a	<3.3	<3.3	99	NGS	3-Octanone	106-68-3	S16T021651
	Va Q		n/a	n/a	n/a	n/a	<2.7	<2.7	100	NGS	3-Heptanone	106-35-4	S16T021651
TIDU VOA #2 TIDU VOA *2	Vа		n/a	n/a	n/a	n/a	<1.9	<1.9	93	NGS	3-Buten-2-one	78-94-4	S16T021651
TIDU VOA #2	1/a		n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	2-Methylfuran	534-22-5	S16T021651
The The	Va Q		n/a	n/a	n/a	n/a	<2.5	<2.5	96	NGS	2-Hexanone	591-78-6	S16T021651
The The	1/a Q		n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	2-Heptanone	110-43-0	S16T021651
The The	Va		n/a	n/a	n/a	n/a	<3.1	<3.1	96	NGS	2-Butanone	78-93-3	S16T021651
The The	νa		n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	2,5-Dihydrofuran	1708-29-8	S16T021651
The The	N/a Q		n/a	n/a	n/a	n/a	<4.1	<4.1	110	NGS	2,4-Dimethylpyridine	108-47-4	S16T021651
The	n/a		n/a	n/a	n/a	n/a	<8.9	<8.9	100	NGS	1-Propanol	71-23-8	S16T021651
The The	√a Q		n/a	n/a	n/a	n/a	<9.1	<9.1	98	NGS	1-Heptanol	111-70-6	S16T021651
The The	√a		n/a	n/a	n/a	n/a	<4.3	<4.3	110	NGS	1-Butanol	71-36-3	S16T021651
The The	n/a		n/a	n/a	n/a	n/a	<2.0	<2.0	99	NGS	1,4-Dioxane	123-91-1	S16T021651
The cas	√a Q		n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	1,4-Dichlorobenzene	106-46-7	S16T021651
The cas	n/a		n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	1,3-Dichloropropene (Total)	542-75-6	S16T021651
R A# CAS # Analyte Analyte	n/a		n/a	n/a	n/a	n/a	<1.7	<1.7	100	NGS	1,2-Dichloroethane	107-06-2	S16T021651
R A# CAS # Analyte Unit STD % Blank Result Duplicate Average RPD % Spk Rec % PD % Spk Rec % RPD % Spk Rec % PD % Spk Rec % RPD % Spk Rec % Spk Rec % RPD % Spk Rec % RPD % Spk Rec % RPD % Spk Rec % Spk Rec % RPD % Spk Rec % RPD % Spk Rec % Spk Rec % RPD % Spk Rec % RPD % Spk Rec % Spk R	n/a		n/a	n/a	n/a	n/a	<1.7	<1.7	93	NGS	1,1-Dichloroethene	75-35-4	S16T021651
R A# CAS # Analyte Unit STD % Blank Result Duplicate Average RPD % Spk Rec % TDU VOA #2	n/a		n/a	n/a	n/a	n/a	<1.7	<1.7	99	NGS	1,1-Dichloroethane	75-34-3	S16T021651
R A# CAS # Analyte Unit STD % Blank Result Duplicate Average RPD % Spk Rec % -TDU VOA #2 79-34-5 1,1,2,2-Tetrachloroethane NGS 100 <3.0	n/a Q		n/a	n/a	n/a	n/a	<2.3	<2.3	100	NGS	1,1,2-Trichloroethane	79-00-5	S16T021651
R A# CAS# Analyte Unit STD% Blank Result Duplicate Average RPD% Spk Rec % POR-TDU VOA #2	n/a Q		n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	1,1,2,2-Tetrachloroethane	79-34-5	S16T021651
R A# CAS# Analyte Unit STD% Blank Result Duplicate Average RPD% Spk Rec%												VOA #2	VAPOR-TDU
	r % Qual Flag	et Limit Cot En		PD % Spk R	Average R	Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

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T - Tentatively Identified Compound

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

B - Blank Contamination L - LLS Outside Range

Sample Group: 20162143

SDG Number: Customer Sample ID: 16-06172-2-BLANK Customer Sample ID: 16-06172-2-BLANK

									,					
VAPOR-TDU VOA #2	N NC	OA #2												
S16T021651		100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a		4.2	n/a Q	ຍ
S16T021651	-	123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a		3.0		
S16T021651		109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
S16T021651	-	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a		1.5		
S16T021651	7	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a		2.5		۵
S16T021651	+	75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a		1.6		
S16T021651	\dashv	67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021651	1	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a		1.4		
S16T021651	\dashv	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a		3.3	n/a Q	۵
S16T021651	+	64-17-5	Ethanol	NGS	100	3.8	7.0	n/a	n/a	n/a		3.7		B.
S16T021651	۲	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021651	Н	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a		2.4		Ø
S16T021651	Н	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a		1.6		
S16T021651		110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a		1.3		
S16T021651	Н	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a		2.6		Ω
S16T021651	_	126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a		1.8	9	
S16T021651	_	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a		4.1		
S16T021651		91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a		5.3		۵
S16T021651	Н	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a		4.7		۵
S16T021651	-	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a		2.6		S
S16T021651		107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021651	-	110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a		2.8		-
S16T021651	\vdash	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a		2.7	n/a Q	۵
S16T021651	-	127-18-4	Tetrachloroethene	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8	n/a Q	۵
S16T021651		108-88-3	Toluene	NGS	110	<2.2	<2.2	n/a	n/a	n/a		2.2		۵
S16T021651	-	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a		1.6		
S16T021651	Н	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a		1.9		
S16T021651	-	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021651	-	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a		2.4	n/a Q	٥

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range
T - Tentatively Identified Compound

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

B - Blank Contamination L - LLS Outside Range

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range NA = Not Analyzed, ND = Not Detected 19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-BLANK
Customer Sample ID: 16-06172-2-BLANK

n/a		2.	n/a	n/a	n/a	n/a	<2.1	<2.1	100	NGS	10061-02-6 trans-1,3-Dichloropropene	10061-02-6	S16T021651
n/a	6	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	110	NGS	n-Heptane	142-82-5	S16T021651
								9				VOA #2	VAPOR-TDU VOA #2
r % Qual Flags	tt Cat En	Det Lim	Spk Rec %	RPD %	Average RPD %	Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-C1
Customer Sample ID: 16-06172-2-C1

VAPOR-TDU VOA #2	Š	VOA #2											
S16T021652		79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a		3.0	n/a
S16T021652		79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a			
S16T021652		75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a		
S16T021652		75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a			
S16T021652		107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	e.	1.7	
S16T021652		542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a			n/a
S16T021652		106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a			
S16T021652		123-91-1	1,4-Dioxane	NGS	99	<2.0	<2.0	n/a	n/a	n/a		2.0	n/a
S16T021652		71-36-3	1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a			
S16T021652		111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a			n/a
S16T021652		71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a			
S16T021652		108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a			
S16T021652		1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a			
S16T021652		78-93-3	2-Butanone	NGS	96	<3.1	3.2	n/a	n/a	n/a			
S16T021652		110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a			n/a
S16T021652		591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a			
S16T021652		534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a		1.3	n/a
S16T021652		78-94-4	3-Buten-2-one	NGS	93	<1.9	<1.9	n/a	n/a	n/a			n/a
S16T021652		106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a			
S16T021652		106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a			
S16T021652		105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a			n/a
S16T021652		108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	ig.		
S16T021652		67-64-1	Acetone	NGS	86	<2.8	380	n/a	n/a	n/a		2.8	
S16T021652		75-05-8	Acetonitrile	NGS	100	<1.6	430	n/a	n/a	n/a	n/a		n/a E
S16T021652		98-86-2	Acetophenone	NGS	100	<6.2	14	n/a	n/a	n/a	n/a	6.2	n/a
S16T021652		107-13-1	Acrylonitrile	NGS	100	<2.1	2.1	n/a	n/a	n/a	n/a		
S16T021652		107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	1000	
S16T021652		107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a			
S16T021652		71-43-2	Benzene	NGS	110	<1.5	1.9	n/a	n/a	n/a			

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination
L - LLS Outside Range

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-C1
Customer Sample ID: 16-06172-2-C1

Sample# R	A# CAS#		Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	U VOA #2													
S16T021652	100-47-0		Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	
S16T021652	123-72-8		Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	
S16T021652	109-74-0		Butanenitrile	NGS	110	2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
S16T021652	56-23-5		Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	
S16T021652	108-90-7		Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021652	75-00-3		Chloroethane	NGS	110	<1.6	2.8	n/a	n/a	n/a	n/a	1.6	n/a J	
S16T021652	67-66-3		Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021652	110-82-7		Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	
S16T021652	124-18-5		Decane	NGS	100	<3.3	\$3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021652	64-17-5		Ethanol	NGS	100	3.8	200	n/a	n/a	n/a	n/a	3.7	n/a B	
S16T021652	141-78-6	esavo	Ethyl acetate	NGS	98	<1.8	4.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021652	100-41-4		Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	
S16T021652	110-00-9		Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021652	110-54-3		Hexane	NGS	96	<1.3	<1.3	e/u	n/a	n/a	n/a	1.3	n/a	
S16T021652	628-73-9		Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021652	126-98-7	9.	Methacrylonitrile	NGS	110	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	r/a J	
S16T021652	75-09-2		Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021652	91-20-3		Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	
S16T021652	98-95-3		Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	
S16T021652	110-59-8		Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021652	107-12-0		Propanenitrile	NGS	100	<1.8	2.8	n/a	n/a	n/a	n/a	1.8	n/a J	
S16T021652	110-86-1	L	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L	
S16T021652	100-42-5		Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	1
S16T021652	127-18-4		Tetrachloroethene	NGS	100	<1.8	78	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021652	108-88-3		Toluene	NGS	110	<2.2	3.0	n/a	n/a	n/a	n/a	2.2	n/a J	
S16T021652	79-01-6		Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	
S16T021652	75-69-4		Trichlorofluoromethane	NGS	98	<1.9	330	n/a	n/a	n/a	n/a	1.9	n/a	
S16T021652	1006	ģ	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021652	123-86-4		n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	24	n/a	

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blani

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

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Customer Sample ID: 16-06172-2-C1 Customer Sample ID: 16-06172-2-C1

Sample Group: 20162143 SDG Number:

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2			Market and Allendaria			1 0 1					
S16T021652	142-82-5	n-Heptane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021652	10061-02-6	6 trans-1,3-Dichloropropene	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a

19 - Aug - 2016 11:05:53 DSRHardcopyWOLImits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-D1 Customer Sample ID: 16-06172-2-D1

		-							-				+	
	n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	99	NGS	Allyl Chloride	107-05-1		S16T021653
	n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	96	NGS	Allyl Alcohol	107-18-6	-	S16T021653
	n/a	2.1	n/a	n/a	n/a	n/a	<2.1	2.1	100	NGS	Acrylonitrile	107-13-1	-	S16T021653
	n/a .	6.2	n/a	n/a	n/a	n/a	9.6	<6.2	100	NGS	Acetophenone	98-86-2	-	S16T021653
111	n/a t	1.6	n/a	n/a	n/a	n/a	1.8E+03	<1.6	100	NGS	Acetonitrile	75-05-8	1	S16T021653
1	n/a E	2.8	n/a	n/a	n/a	n/a	700	<2.8	86	NGS	Acetone	67-64-1	1	S16T021653
	n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	4-Methyl-2-Pentanone	108-10-1	1	S16T021653
	n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	4-Methyl-2-hexanone	105-42-0		S16T021653
	n/a	3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	99	NGS	3-Octanone	106-68-3	-	S16T021653
	n/a	2.7	n/a	n/a	n/a	n/a	<2.7	<2.7	100	NGS	3-Heptanone	106-35-4	H	S16T021653
	n/a	1.9	n/a	n/a	n/a	n/a	6.0	<1.9	93	NGS	3-Buten-2-one	78-94-4	-	S16T021653
	n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	2-Methylfuran	534-22-5	-	S16T021653
	n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	96	NGS	2-Hexanone	591-78-6	-	S16T021653
	n/a	2.6	· n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	2-Heptanone	110-43-0	-	S16T021653
	n/a	3.1	n/a	n/a	n/a	n/a	<3.1	<3.1	96	NGS	2-Butanone	78-93-3	-	S16T021653
	n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	2,5-Dihydrofuran	1708-29-8	-	S16T021653
	n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	110	NGS	2,4-Dimethylpyridine	108-47-4	-	S16T021653
	n/a	8.9	n/a	n/a	n/a	e/n	<8.9	<8.9	100	NGS	1-Propanol	71-23-8	H	S16T021653
	n/a	9.1	n/a	n/a	n/a	n/a	<9.1	<9.1	98	NGS	1-Heptanol	111-70-6	-	S16T021653
	n/a	4.3	n/a	n/a	n/a	n/a	<4.3	<4.3	110	NGS	1-Butanol	71-36-3	H	S16T021653
	n/a	2.0	n/a	n/a	n/a	n/a	2.5	<2.0	99	NGS	1,4-Dioxane	123-91-1	-	S16T021653
	n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	1,4-Dichlorobenzene	106-46-7	H	S16T021653
	n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	1,3-Dichloropropene (Total)	542-75-6	-	S16T021653
	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	100	NGS	1,2-Dichloroethane	107-06-2		S16T021653
	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	93	NGS	1,1-Dichloroethene	75-35-4	-	S16T021653
	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	99	NGS	1,1-Dichloroethane	75-34-3	-	S16T021653
	n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	100	NGS	1,1,2-Trichloroethane	79-00-5	H	S16T021653
	n/a	3.0	n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	1,1,2,2-Tetrachloroethane	79-34-5	-	S16T021653
									1			OA #2	DU V	VAPOR-TDU VOA #2
Det Limit Cnt Err % Qual Flags	Cnt Err %	Det Limit	Average RPD % Spk Rec %	RPD %	Average	Result Duplicate		Blank	STD %	Unit	Analyte	A# CAS#	A#	Sample# R

NA = Not Analyzed, ND = Not Detected

N - Named TIC Y - Comment

S16T021653

71-43-2

Benzene

NGS

110

<1.5

n/a

n/a

n/a

n/a J

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

C.71

Sample Group: 20162143 SDG Number:

Sample# R	¥	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average.	RPD %	Result Duplicate Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	lual Flags
CASTONASS IND	5	A #Z	Donatali	100										
S16T021653	\top	123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	מלום	n/a	3.0	n/a	
S16T021653		109-74-0	Butanenitrile	NGS	110	2.1	<2.1	n/a	n/a	n/a	T	21		
S16T021653		56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a		1.5		
S16T021653		108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a		2.5		
S16T021653		75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a		1.6		
S16T021653		67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021653	0	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a		1.4		
S16T021653		124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	T	3.3		
S16T021653		64-17-5	Ethanol	NGS	100	3.8	160	n/a	n/a	n/a		3.7	n/a B	
S16T021653		141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a		1.8		
S16T021653		100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a		2.4		
S16T021653		110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a		1.6		
S16T021653		110-54-3	Hexane	NGS	96	<1.3	₹1.3	n/a	n/a	n/a		1.3		
S16T021653		628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		
S16T021653		126-98-7	Methacrylonitrile	NGS	110	<1.8	4.5	n/a	n/a	n/a		1.8		
S16T021653		75-09-2	Methylene Chloride	NGS	100	4.1	<4.1	n/a	n/a	n/a	n/a	4.1		
S16T021653		91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	
S16T021653		98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		
S16T021653		110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		
S16T021653		107-12-0	Propanenitrile	NGS	100	<1.8	6.0	n/a	n/a	n/a	n/a	1.8		
S16T021653		110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	1	
S16T021653		100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
S16T021653		127-18-4	Tetrachloroethene	NGS	100	<1.8	78	n/a	n/a	n/a	n/a	1.8		
S16T021653		108-88-3	Toluene	NGS	110	<2.2	2.3	n/a	n/a	n/a	n/a	2.2		
S16T021653		79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		
S16T021653		75-69-4	Trichlorofluoromethane	NGS	98	<1.9	220	n/a	n/a	n/a	n/a	1.9		
S16T021653		10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		
S16T021653		123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	2,4		

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination L - LLS Outside Range

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DSR.Jar v. 3.0.12

Sample Group: 20162143 SDG Number:

Cartridge Evaluation
Data Summary of All Results

S16T021653 S16T021653 Sample# R A# CAS# VAPOR-TDU VOA #2 Customer Sample ID: 16-06172-2-D1 Customer Sample ID: 16-06172-2-D1 142-82-5 142-82-5 n-Heptane 10061-02-6 trans-1,3-Dichloropropene Analyte NGS Unit STD% 100 <2.1 Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags n/a n/a n/a n/a n/a

19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-E1 Customer Sample ID: 16-06172-2-E1

-		ampie .	Campio 10. 10-00 11 F-F-F-											
Sample# R	A# CAS#		Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	U VOA #2													
S16T021654	79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	
S16T021654	79-00-5		1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
S16T021654	75-34-3		1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021654	75-35-4		1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	2
S16T021654	107-06-2		,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021654	542-75-6		1,3-Dichloropropene (Total)	NGS	100	<1.8	^1.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021654	106-46-7		1,4-Dichlorobenzene	NGS	100	<4.1	4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021654	123-91-1		1,4-Dioxane	NGS	99	<2.0	5.6	n/a	n/a	n/a	n/a	2.0	n/a J	
S16T021654	71-36-3		1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	
S16T021654	111-70-6	75	1-Heptanoi	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	
S16T021654	71-23-8		-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	
S16T021654	108-47-4	95	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021654	1708-29-8		2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	
S16T021654	78-93-3		2-Butanone	NGS	96	<3.1	<3.1	B/u	n/a	n/a	n/a	3.1	n/a	
S16T021654	110-43-0		2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021654	591-78-6		2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021654	534-22-5		2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	
S16T021654	78-94-4		3-Buten-2-one	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	
S16T021654	106-35-4		3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
S16T021654	106-68-3		3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021654	105-42-0		4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021654	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	
S16T021654	67-64-1		Acetone	NGS	86	<2.8	1.3E+03	n/a	n/a	n/a	n/a	2.8	n/a E	
S16T021654	75-05-8		Acetonitrile	NGS	100	<1.6	450	n/a	n/a	n/a	n/a	1.6	n/a E	
S16T021654	98-86-2		Acetophenone	NGS	100	<6.2	8.2	n/a	n/a	n/a	n/a	6.2	n/a J	
S16T021654	107-13-1		Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
S16T021654	107-18-6	1000	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
S16T021654	107-05-1		Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021654	71-43-2		Benzene	NGS	110	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	r e/u	

NA = Not Analyzed, ND = Not Detected

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T - Tentatively Identified Compound

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

B - Blank Contamination L - LLS Outside Range

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Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-E1
Customer Sample ID: 16-06172-2-E1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2	3-										
S16T021654	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021654	123-72-8	Butanal	NGS	100	<3.0	5.1	n/a	n/a	n/a	n/a	3.0	n/a J
S16T021654	109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021654	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S16T021654	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021654	75-00-3	Chloroethane	NGS	110	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021654	67-66-3	Chloroform	NGS	100	<1.8	1.8	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021654	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
S16T021654	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021654	64-17-5	Ethanol	NGS	100	3.8	240	n/a	n/a	n/a	n/a	3.7	n/a B
S16T021654	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021654	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021654	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021654	110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021654	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021654	126-98-7	Methacrylonitrile	NGS	110	<1.8	3.2	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021654	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021654	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021654	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
S16T021654	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021654	107-12-0	Propanenitrile	NGS	100	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a
S16T021654	110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021654	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021654	127-18-4	Tetrachloroethene	NGS	100	<1.8	42	n/a	n/a	n/a	n/a	1.8	n/a
S16T021654	108-88-3	Toluene	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021654	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021654	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	670	n/a	n/a	n/a	n/a	1.9	n/a E
S16T021654	10061-01-5	-5 cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021654	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a

E - Outside Calibration Range
T - Tentatively Identified Compound

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

Q - Qualitative J - Estimated

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E - Outside Calibration Range
T - Tentatively Identified Compound

Calibration Page

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination L - LLS Outside Range Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162143

SDG Number:

S16T021654 Sample# R A# CAS# S16T021654 VAPOR-TDU VOA #2 Customer Sample ID: 16-06172-2-E1
Customer Sample ID: 16-06172-2-E1 10061-02-6 trans-1,3-Dichloropropene 142-82-5 Analyte n-Heptane Unit NGS STD % 110 100 Blank <1.6 <2.1 Result Duplicate 2.1 n/a Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags n/a n/a n/a n/a

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-EFF-BASE Customer Sample ID: 16-06172-2-EFF-BASE

Sample# R	A# CAS#	S#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	# AOV UC	2											
S16T021655	79-	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S16T021655	79-	79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	e/u	n/a	n/a	n/a	2.3	n/a
S16T021655	75-	75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021655	75-	75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021655	107	107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021655	542	542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021655	106	106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021655	123	123-91-1	1,4-Dioxane	NGS	99	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a
S16T021655	71-	71-36-3	1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a
S16T021655	111	111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a
S16T021655	71-	71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a
S16T021655	108	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021655	170	708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021655	78-	78-93-3	2-Butanone	NGS	96	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a
S16T021655	110	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	e/u	n/a	n/a	n/a	2.6	n/a
S16T021655	591	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021655	534	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021655	78-	78-94-4	3-Buten-2-one	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
S16T021655	106	106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	e/u	n/a	n/a	n/a	2.7	n/a
S16T021655	106	106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021655	105	105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	e/u	n/a	n/a	n/a	2.6	n/a
S16T021655	108	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
S16T021655	67-	67-64-1	Acetone	NGS	86	<2.8	17	e/u	n/a	n/a	n/a	2.8	n/a
S16T021655	75-	75-05-8	Acetonitrile	NGS	100	<1.6	19	n/a	n/a	n/a	n/a	1.6	n/a
S16T021655	98-	98-86-2	Acetophenone	NGS	100	<6.2	8.2	n/a	n/a	n/a	n/a	6.2	n/a J
S16T021655	107	107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	e/u	n/a	n/a	n/a	2.1	n/a
S16T021655	107	107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	e/u	n/a	n/a	n/a	2.3	n/a
S16T021655	107	107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
\$161021655	71-	71-43-2	Benzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a

E - Outside Calibration Range
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Q - Qualitative J - Estimated

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

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-EFF-BASE Customer Sample ID: 16-06172-2-EFF-BASE

- N	-											
VAPOR-TDU VOA #2	U VOA #2											
S16T021655	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021655	123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S16T021655	109-74-0	Butanenitrile	NGS	110	2.1	2.1	n/a	n/a	n/a	n/a	21	n/a
S16T021655	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1 1	n/a
S16T021655	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021655	75-00-3	Chloroethane	NGS	110	<1.6	<u><1.6</u>	n/a	n/a	n/a	n/a	16	n/a
S16T021655	67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a		n/a
S16T021655	110-82-7	Cyclohexane	NGS	99	<1.4	41.4	n/a	n/a	n/a	n/a	1 4	n/a
S16T021655	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	33 3	0/2
S16T021655	64-17-5	Ethanol	NGS	100	3.8	9.6	n/a	n/a	n/a	n/a	3.7	n/a BJ
S16T021655	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a		n/a
S16T021655	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021655	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021655	110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021655	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021655	126-98-7	Methacrylonitrile	NGS	110	<1.8	2.1	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021655	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021655	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021655	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
S16T021655	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021655	107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021655	110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021655	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021655	127-18-4	Tetrachloroethene	NGS	100	<1.8	140	n/a	n/a	n/a	n/a	1.8	n/a
S16T021655	108-88-3	Toluene	NGS	110	<2.2	3.8	n/a	n/a	n/a	n/a	2.2	n/a J
S16T021655	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021655	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a
S16T021655	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021655	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	π/a	2.4	n/a

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-EFF-BASE Customer Sample ID: 16-06172-2-EFF-BASE

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2											
S16T021655	142-82-5	n-Heptane	NGS	110	<1.6	2.5	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021655	10061-02-6	trans-1,3-Dichloropropene	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a

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N - Named TIC
Y - Comment

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

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-F1 Customer Sample ID: 16-06172-2-F1

Sample# R	A#	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	S	A #2											
S16T021656	П	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S16T021656		79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a
S16T021656		75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021656		75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021656		107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a
S16T021656		542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021656		106-46-7	1,4-Dichlorobenzene	NGS	100	4.1	4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021656		123-91-1	1,4-Dioxane	NGS	99	<2.0	3.2	n/a	n/a	n/a	n/a	2.0	n/a J
S16T021656		71-36-3	1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a
S16T021656		111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a
S16T021656		71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a
S16T021656	Г	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021656		1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021656		78-93-3	2-Butanone	NGS	96	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a
S16T021656	Г	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021656	Г	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021656	Г	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021656	Г	78-94-4	3-Buten-2-one	NGS	93	<1.9	13	n/a	n/a	n/a	n/a	1.9	n/a
S16T021656	Г	106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021656		106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021656		105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021656		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
S16T021656		67-64-1	Acetone	NGS	86	<2.8	1.8E+03	n/a	n/a	n/a	n/a	2.8	n/a E
S16T021656		75-05-8	Acetonitrile	NGS	100	<1.6	480	n/a	n/a	n/a	n/a	1.6	n/a E
S16T021656		98-86-2	Acetophenone	NGS	100	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a
S16T021656		107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021656		107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a
S16T021656		107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021656		71-43-2	Benzene	NGS	110	<1.5	1.6	n/a	n/a	n/a	n/a	1.5	n/a J

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Sample Group: 20162143

Customer Sample ID: 16-06172-2-F1	Customer Sample ID: 16-06172-2-F1	SDG Number:	

	24	n/a	n/a	n/a	n/a	504	<2.4	93	NGS	n-Butyl acetate	123-86-4	STATOTASA
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	cis-1,3-Dichloropropene	10061-01-5	S16T021656
n/a E	1.9	n/a	n/a	n/a	n/a	500	<1.9	98	NGS	Trichlorofluoromethane	75-69-4	S16T021656
n/a	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	100	NGS	Trichloroethene	79-01-6	S16T021656
n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	Toluene	108-88-3	S16T021656
n/a	1.8	n/a	n/a	n/a	n/a	31	<1.8	100	NGS	Tetrachloroethene	127-18-4	S16T021656
n/a	2.7	n/a	n/a	n/a	n/a	<2.7	<2.7	110	NGS	Styrene	100-42-5	S16T021656
n/a L	2.8	n/a	n/a	n/a	n/a	<2.8	<2.8	100	NGS	Pyridine	110-86-1	S16T021656
n/a	1.8	n/a	n/a	n/a	n/a	22	<1.8	100	NGS	Propanenitrile	107-12-0	S16T021656
n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	110	NGS	Pentanenitrile	110-59-8	S16T021656
n/a	4.7	n/a	n/a	n/a	n/a	<4.7	<4.7	94	NGS	Nitrobenzene	98-95-3	S16T021656
n/a	5.3	n/a	n/a	n/a	n/a	<5.3	<5.3	110	NGS	Naphthalene	91-20-3	S16T021656
n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	Methylene Chloride	75-09-2	S16T021656
n/a J	1.8	n/a	n/a	n/a	n/a	2.6	<1.8	110	NGS	Methacrylonitrile	126-98-7	S16T021656
n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	100	NGS	Hexanenitrile	628-73-9	S16T021656
n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	Hexane	110-54-3	S16T021656
n/a	1.6	n/a	Г	n/a	n/a	<1.6	<1.6	95	NGS	Furan	110-00-9	S16T021656
n/a	2.4	n/a	n/a	n/a	n/a	<2.4	<2.4	110	NGS	Ethylbenzene	100-41-4	S16T021656
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	98	NGS	Ethyl acetate	141-78-6	S16T021656
n/a B	3.7	n/a	n/a	n/a	n/a	200	3.8	100	NGS	Ethanol	64-17-5	S16T021656
n/a	3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	100	NGS	Decane	124-18-5	S16T021656
r/a J	1.4	n/a	n/a	n/a	n/a	1.5	<1.4	99	NGS	Cyclohexane	110-82-7	S16T021656
r/a J	1.8	n/a	- n/a	n/a	n/a	4.1	<1.8	100	NGS	Chloroform	67-66-3	S16T021656
n/a	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	110	NGS	Chloroethane	75-00-3	S16T021656
n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	110	NGS	Chlorobenzene	108-90-7	S16T021656
n/a	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	100	NGS	Carbon tetrachloride	56-23-5	S16T021656
n/a	2.1	n/a	n/a	n/a	n/a	<2.1	<2.1	110	NGS	Butanenitrile	109-74-0	S16T021656
n/a	3.0	n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	Butanal	123-72-8	S16T021656
n/a	4.2	n/a	n/a	n/a	n/a	<4.2	<4.2	100	NGS	Benzonitrile	100-47-0	S16T021656
											VOA #2	VAPOR-TDU VOA #2
Det Cilling Citt Err % QUBI Flags						1000	-			0.0000000	0.000	

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E - Outside Calibration Range
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Cartridge Evaluation
Data Summary of All Results

19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample Group: 20162143 SDG Number:

S16T021656 Sample# R A# CAS# S16T021656 VAPOR-TDU VOA #2 Customer Sample ID: 16-06172-2-F1 Customer Sample ID: 16-06172-2-F1 142-82-5 142-82-5 n-Heptane 10061-02-6 trans-1,3-Dichloropropene Analyte Unit NGS STD % 100 2.1 Result Duplicate <1.6 n/a Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags n/a n/a

n/a

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-G1 Customer Sample ID: 16-06172-2-G1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	U VOA #2		3										
S16T021657	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	
S16T021657	79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	B/U	n/a	n/a	n/a	2.3	n/a	
S16T021657	75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021657	75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021657	107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021657	542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	
S16T021657	106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021657	123-91-1	1,4-Dioxane	NGS	99	<2.0	-6.0	n/a	n/a	n/a	n/a	2.0	n/a J	C
S16T021657	71-36-3	1-Butanol	NGS	110	<4.3	<4.3	8/u	n/a	n/a	n/a	4.3	n/a	
S16T021657	111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	
S16T021657	71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	
S16T021657	108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021657	1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	
S16T021657	78-93-3	2-Butanone	NGS	96	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	
S16T021657	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021657	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021657	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	
S16T021657	78-94-4	3-Buten-2-one	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	
S16T021657	106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	
S16T021657	106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021657	105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021657	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	
S16T021657	67-64-1	Acetone	NGS	86	<2.8	1.3E+03	n/a	n/a	n/a	n/a	2.8	n/a E	Е
S16T021657	75-05-8	Acetonitrile	NGS	100	<1.6	640	n/a	n/a	B/u	n/a	1.6	n/a E	Э
S16T021657	98-86-2	Acetophenone	NGS	100	<6.2	<6.2	n/a	n/a	e/u	n/a	6.2	n/a	#C
S16T021657	107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		
S16T021657	107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	e/u	n/a	2.3	n/a	
S16T021657	107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		
S16T021657	71-43-2	Benzene	NGS	110	<1.5	1.5	n/a	n/a	n/a	n/a	1.5	r/a J	_

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SDG Number: Customer Sample ID: 16-06172-2-G1 Customer Sample ID: 16-06172-2-G1

Sample# R	A# CAC#	Analyto	lina		Diane.	2						
	TONO #	and the second	omic	% O.I.C	Cidity	Mean	Result Duplicate Average RPD % Spx Rec %	Average	KPU %	Spx Kec %	net rimit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2											
S16T021657	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021657	123-72-8	Butanal	NGS	100	<3.0	4.9	n/a	n/a	n/a	n/a	3.0	n/a J
S16T021657	109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021657	56-23-5	Carbon tetrachloride	NGS	100	<1.5	4.5	n/a	n/a	n/a	n/a	1.5	n/a
S16T021657	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021657	75-00-3	Chloroethane	NGS	110	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021657	67-66-3	Chloroform	NGS	100	<1.8	4.6	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021657	110-82-7	Cyclohexane	NGS	99	<1.4	1.8	n/a	n/a	n/a	n/a	1.4	r/a J
S16T021657	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	ယ္သ	n/a
S16T021657	64-17-5	Ethanol	NGS	100	3.8	170	n/a	n/a	n/a	n/a	3.7	n/a B
S16T021657	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021657	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021657	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021657	110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021657	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021657	126-98-7	Methacrylonitrile	NGS	110	<1.8	2.2	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021657	75-09-2	Methylene Chloride	NGS	100	<4.1	4.	n/a	n/a	n/a	n/a	4.1	n/a
S16T021657	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021657	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
S16T021657	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021657	107-12-0	Propanenitrile	NGS	100	<1.8	21	n/a	n/a	n/a	n/a	1.8	n/a
S16T021657	110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021657	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021657	127-18-4	Tetrachioroethene	NGS	100	<1.8	14	n/a	n/a	n/a	n/a	1.8	n/a
S16T021657	108-88-3	Toluene	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021657	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021657	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	400	n/a	n/a	n/a	n/a	1.9	n/a
S16T021657	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021657	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	o/o	2/2	6/0	24	pla

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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NA = Not Analyzed, ND = Not Detected B - Blank Contamination L - LLS Outside Range 19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation
Data Summary of All Results

Customer Sample ID: 16-06172-2-G1 Customer Sample ID: 16-06172-2-G1

Sample Group: 20162143 SDG Number:

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T021657	142-82-5	n-Heptane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021657	10061-02-6	trans-1,3-Dichloropropene	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-H1 Customer Sample ID: 16-06172-2-H1

n/a J	1.5	n/a	n/a	n/a	n/a	6.5	<1.5	110	NGS	Benzene	71-43-2	S16T021658
n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	99	NGS	Allyl Chloride	107-05-1	S16T021658
n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	96	NGS	Allyl Alcohol	107-18-6	S16T021658
n/a	2.1	n/a	n/a	n/a	n/a	<2.1	<2.1	100	NGS	Acrylonitrile	107-13-1	S16T021658
n/a J	6.2	n/a	n/a	n/a	n/a	6.3	<6.2	100	NGS	Acetophenone	98-86-2	S16T021658
n/a E	1.6	n/a	n/a	n/a	n/a	780	<1.6	100	NGS	Acetonitrile	75-05-8	S16T021658
n/a EY	2.8	n/a	n/a	n/a	n/a	2.6E+03	<2.8	86	NGS	Acetone	67-64-1	S16T021658
n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	4-Methyl-2-Pentanone	108-10-1	S16T021658
n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	4-Methyl-2-hexanone	105-42-0	S16T021658
n/a	3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	99	NGS	3-Octanone	106-68-3	S16T021658
n/a	2.7	n/a	n/a	n/a	n/a	33	<2.7	100	NGS	3-Heptanone	106-35-4	S16T021658
n/a J	1.9	n/a	n/a	n/a	n/a	7.3	<1.9	93	NGS	3-Buten-2-one	78-94-4	S16T021658
n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	2-Methylfuran	534-22-5	S16T021658
n/a J	2.5	n/a	n/a	n/a	n/a	10	<2.5	96	NGS	2-Hexanone	591-78-6	S16T021658
n/a J	2.6	n/a	n/a	n/a	n/a	5.6	<2.6	98	NGS	2-Heptanone	110-43-0	S16T021658
n/a	3.1	n/a	n/a	n/a	n/a	180	<3.1	96	NGS	2-Butanone	78-93-3	S16T021658
· n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	2,5-Dihydrofuran	1708-29-8	S16T021658
n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	110	NGS	2,4-Dimethylpyridine	108-47-4	S16T021658
n/a	8.9	n/a	n/a	n/a	e/u	69	<8.9	100	NGS	1-Propanol	71-23-8	S16T021658
n/a	9.1	n/a	n/a	n/a	n/a	<9.1	<9.1	86	NGS	1-Heptanol	111-70-6	16T021658
n/a	4.3	n/a	n/a	n/a	n/a	250	<4.3	110	NGS	1-Butanol	71-36-3	S16T021658
n/a J	2.0	n/a	n/a	n/a	n/a	4.3	<2.0	99	NGS	1,4-Dioxane	123-91-1	S16T021658
n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	1,4-Dichlorobenzene	106-46-7	S16T021658
n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	1,3-Dichloropropene (Total)	542-75-6	S16T021658
n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	100	NGS	1,2-Dichloroethane	107-06-2	16T021658
n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	93	NGS	1,1-Dichloroethene	75-35-4	S16T021658
n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	99	NGS	1,1-Dichloroethane	75-34-3	S16T021658
n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	100	NGS	1,1,2-Trichloroethane	79-00-5	S16T021658
n/a	3.0	n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	1,1,2,2-Tetrachloroethane	79-34-5	S16T021658
											VOA #2	VAPOR-TDU VOA #2
Det Limit Cnt Err % Qual Flags	Det Limit	Average RPD % Spk Rec %	RPD %	Average	Result Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

E - Outside Calibration Range
T - Tentatively Identified Compound

N - Named TIC Y - Comment

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B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-H1
Customer Sample ID: 16-06172-2-H1

Simple R AB CAS 8 Manayive Mint STD % Blank Rasult Duplicate Manage RAP Spk Rac % DetLimit Cinter % Qual Flags Significates Cinter % Qual Flags RAP Significate Cinter % Qual Flags RAP Significate Cinter % Qual Flags RAP Significate Cinter % Qual Flags RAP RA													
	R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %		Det Limit	Cnt Err % Qual Flags
10047-0 Benzonitrile NGS 100 <4.2 <4.2 n/a	VAPOR-TDU	VOA #2				201							
103-72-8 Butanel NGS 100 <2,1 0.4 0.14 0.16 0.18 0.16 0.19 0.21 0.24 0.25 0.2	S16T021658	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
109-74-0 Butanenthile NGS 110 <2.1 2.6 n/a n	S16T021658	123-72-8	Butanal	NGS	100	<3.0	17	n/a	n/a	n/a	n/a	3.0	n/a
59-23-5 Carbon tetrachloride NGS 100 <1.5 <1.5 n/a n/a </td <td>S16T021658</td> <td>109-74-0</td> <td>Butanenitrile</td> <td>NGS</td> <td>110</td> <td><2.1</td> <td>26</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>2.1</td> <td>n/a</td>	S16T021658	109-74-0	Butanenitrile	NGS	110	<2.1	26	n/a	n/a	n/a	n/a	2.1	n/a
108-90-7 Chlorobenzene NGS 110 <2.5 <2.5 n/a n/a n/a n/a n/a 1.5	S16T021658	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
	S16T021658	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
	S16T021658	75-00-3	Chloroethane	NGS	110	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a J
110-82.7 Cyclohexane NGS 99 <1.4 N/a N/a	S16T021658	67-66-3	Chloroform	NGS	100	<1.8	4.7	n/a	n/a	n/a	n/a	1.8	n/a J
124-18-5 Decame NGS 100 <3.3 <3.3 <1/8 <1/8 <1/8 <4.17-5 Ethanol NGS 100 3.8 <1.8 <1.8 <1.8 <1.17-5 <4.17-5 Ethanol NGS 100 3.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <	S16T021658	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
Set-17-5	S16T021658	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
14178-6 Ethyl acetate NGS 98 <1.8 <1.8 <1.8 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	S16T021658	64-17-5	Ethanol	NGS	100	3.8	210	n/a	n/a	n/a	n/a	3.7	n/a B
100-41-4 Ethylbenzene NGS 110 <2.4 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6	S16T021658	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
110-00-9 Furan NGS 95 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6	S16T021658	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
110.54-3 Hexane NGS 96 <1.3 26 n/a n/a n/a n/a 1.3 628-73-9 Hexanenitrile NGS 100 <2.6 <2.6 n/a n/a	S16T021658	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
628-73-9 Hexamenitrile NGS 100 <2.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.6 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.8 <1.	S16T021658	110-54-3	Hexane	NGS	96	<1.3	26	n/a	n/a	n/a	n/a	1.3	n/a
128-98-7 Methacrylonitrile NGS 110 <1.8 3.8 n/a n/a n/a n/a 1.8 1.5	S16T021658	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
75-09-2 Methylene Chloride NGS 100 <4.1 0.	S16T021658	126-98-7	Methacrylonitrile	NGS	110	<1.8	3.8	n/a	n/a	n/a	n/a	1.8	n/a J
91-20-3 Naphthalene NGS 110 <5.3 <5.3 <1/a> N/3 N/4 N/3 N/4 N/3 N/4 N/3 N/4 N/3 N/4	S16T021658	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
98-95-3 Nitrobenzene NGS 94 <4.7 n/a n/a n/a n/a n/a 1.0 110-59-8 Pentanenitrile NGS 110 <2.6 4.5 n/a n/a n/a n/a n/a 1.8 110-12-0 Propanenitrile NGS 100 <1.8 30 n/a n/a n/a n/a n/a n/a 1.8 110-85-1 Pyridine NGS 100 <2.8 1.5 n/a n	S16T021658	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
110-59-8 Pentanenitrile NGS 110 <2.6 4.5 n/a n/a n/a n/a n/a n/a 1.8 107-12-0 Propanenitrile NGS 100 <1.8 30 n/a n	S16T021658	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
107-12-0 Propanenitrile NGS 100 <1.8 30 n/a n/a n/a n/a 1.8 110-86-1 Pyridine NGS 100 <2.8	S16T021658	110-59-8	Pentanenitrile	NGS	110	<2.6	4.5	n/a	n/a	n/a	n/a	2.6	n/a J
110-86-1 Pyridine NGS 100 <2.8 15 n/a <	S16T021658	107-12-0	Propanenitrile	NGS	100	<1.8	30	n/a	n/a	n/a	n/a	1.8	n/a
100-42-5 Styrene NGS 110 <2.7 n/a <	S16T021658	110-86-1	Pyridine	NGS	100	<2.8	15	n/a	n/a	n/a	n/a	2.8	n/a L
127-18-4 Tetrachloroethene NGS 100 <1.8 n/a	S16T021658	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
108-88-3 Toluene NGS 110 <2.2 4.0 n/a n/a n/a 2.2 79-01-6 Trichloroethene NGS 100 <1.6	S16T021658	127-18-4	Tetrachloroethene	NGS	100	<1.8	18	n/a	n/a	n/a	n/a	1.8	n/a
79-01-6 Trichloroethene NGS 100 <1.6 n/a	S16T021658	108-88-3	Toluene	NGS	110	<2.2	4.0	n/a	n/a	n/a	n/a	2.2	n/a J
75-69-4 Trichlorofluoromethane NGS 98 <1.9 430 n/a n/a n/a n/a 1.9 10061-01-5 cis-1,3-Dichloropropene NGS 100 <1.8	S16T021658	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
10061-01-5 cis-1,3-Dichloropropene NGS 100 <1.8 <1.8 n/a n/a n/a n/a 1.8	S16T021658	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	430	n/a	n/a	n/a	n/a	1.9	n/a E
123-86-4 n-Butyl acetate NGS 93 <2.4 <2.4 n/a n/a n/a n/a 2.4	S16T021658	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
	S16T021658	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a

NA = Not Analyzed, ND = Not Detected

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

8300

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

C.87

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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

19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation
Data Summary of All Results

n/a	2	2	n/a	n/a	n/a	n/a	1.75	1.7	100	NGO	mans-1,3-Dichiolopiopene	10001-02-0	-	0101021000
	-					-1-			100	100	trong 4 o Dieklarantenana	10061 03 6	_	CASTONASSO
n/a	6		n/a	n/a	n/a	n/a	100	<1.6	110	NGS	n-Heptane	142-82-5		S16T021658
)A #2	TDU VC	VAPOR-TDU VOA #2
rr% Qual Flags	nit Cnt En	Det Lin	Spk Rec %	RPD %	Average	Result Duplicate Average RPD % Spk R	Result	Blank	STD %	Unit	Analyte	A# CAS#	R A#	Sample#
											Customer Sample ID: 16-06172-2-H1	ner Sample	Sustor	
											Customer Sample ID: 16-06172-2-H1	r Sample II	stome	C _L
												er:	SDG Number:	SDG
											-	Sample Group: 20162143	Group	Sample
							SALES SALES SALES SALES SALES							

Sample Group: 20162143 SDG Number: Customer Sample ID: 16-06172-2-H2 Customer Sample ID: 16-06172-2-H2

Sample# R	A#	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	N	OA #2												
S16T021659		79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<3.0	<3.0	n/a	n/a	n/a		3.0	n/a	
S16T021659	П	79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a		2.3	n/a	
S16T021659	П	75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021659		75-35-4	1,1-Dichloroethene	NGS	93	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	
S16T021659		107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a		1.7	n/a	
S16T021659	П	542-75-6	1,3-Dichloropropene (Total)	NGS	100	<1.8	<1.8	n/a	n/a	n/a		1.8	n/a	
S16T021659		106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021659		123-91-1	1,4-Dioxane	NGS	99	<2.0	2.1	n/a	n/a	n/a	n/a	2.0	n/a J	
S16T021659		71-36-3	1-Butanol	NGS	110	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	
S16T021659	Т	111-70-6	1-Heptanol	NGS	98	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	
S16T021659		71-23-8	1-Propanol	NGS	100	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	
S16T021659		108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	
S16T021659		1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	
S16T021659	Г	78-93-3	2-Butanone	NGS	96	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	
S16T021659	Т	110-43-0	2-Heptanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021659	Т	591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021659	Г	534-22-5	2-Methylfuran	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	
S16T021659	Т	78-94-4	3-Buten-2-one	NGS	93	<1.9	14	n/a	n/a	n/a	n/a	1.9	n/a	
S16T021659		106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	4
S16T021659	Г	106-68-3	3-Octanone	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	
S16T021659	Т	105-42-0	4-Methyl-2-hexanone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T021659	Т	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	
S16T021659	Г	67-64-1	Acetone	NGS	86	<2.8	1.8E+03	n/a	n/a	n/a	n/a	2.8	n/a E	100
S16T021659	Т	75-05-8	Acetonitrile	NGS	100	<1.6	620	n/a	n/a	n/a	n/a	1.6	n/a E	
S16T021659	Г	98-86-2	Acetophenone	NGS	100	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	
S16T021659	T	107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	
S16T021659	T	107-18-6	Allyl Alcohol	NGS	96	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	
S16T021659	T	107-05-1	Allyl Chloride	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	
S16T021659	Г	71-43-2	Benzene	NGS	110	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a J	

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-H2
Customer Sample ID: 16-06172-2-H2

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit (Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2											1
S16T021659	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021659	123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S16T021659	109-74-0	Butanenitrile	NGS	110	2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021659	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S16T021659	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021659	75-00-3	Chloroethane	NGS	110	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a J
S16T021659	67-66-3	Chloroform	NGS	100	<1.8	3.7	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021659	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
S16T021659	124-18-5	Decane	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a
S16T021659	64-17-5	Ethanol	NGS	100	3.8	180	n/a	n/a	n/a	n/a	3.7	n/a B
S16T021659	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021659	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021659	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021659	110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021659	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021659	126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021659	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021659	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021659	98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a
S16T021659	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021659	107-12-0	Propanenitrile	NGS	100	<1.8	22	n/a	n/a	n/a	n/a	1.8	n/a
S16T021659	110-86-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021659	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021659	127-18-4	Tetrachloroethene	NGS	100	<1.8	12	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021659	108-88-3	Toluene	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a
S16T021659	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021659	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	440	n/a	n/a	n/a	n/a	1.9	n/a E
S16T021659	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021659	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

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NA = Not Analyzed, ND = Not Detected
Range
B - Blank Contamination
d Compound
L - LLS Outside Range

C.90

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range NA = Not Analyzed, ND = Not Detected 19 - Aug - 2016 11:05:53 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Cartridge Evaluation
Data Summary of All Results

Customer Sample ID: 16-06172-2-H2 Customer Sample ID: 16-06172-2-H2

Sample Group: 20162143 SDG Number:

WADON TOU	NO. HS											
VAPOR-IDU VOA #Z	VUA #Z											
\$16T021659	142-82-5	n-Heptane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021659	10061-02-6	trans-1,3-Dichloropropene	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a

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Sample Group: 20162143
SDG Number:
Customer Sample ID: 16-06172-2-IN-BASE
Customer Sample ID: 16-06172-2-IN-BASE

Tetrachloroethane NGS 100 <3.0	n/a	. 1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	110	NGS	Benzene	71-43-2	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	99	NGS	Allyl Chloride	107-05-1	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <3.0	n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	96	NGS	Allyl Alcohol	107-18-6	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <3.0	n/a	2.1	n/a	n/a	n/a	n/a	<2.1	<2.1	100	NGS	Acrylonitrile	107-13-1	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	r e/u	6.2	n/a	n/a	n/a	n/a	8.1	<6.2	100	NGS	Acetophenone	98-86-2	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a	n/a	1.6	n/a	n/a	n/a	n/a	29	<1.6	100	NGS	Acetonitrile	75-05-8	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	2.8	n/a	n/a	n/a	n/a	37	<2.8	86	NGS	Acetone	67-64-1	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a	n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	4-Methyl-2-Pentanone	108-10-1	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a	n/a	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	98	NGS	4-Methyl-2-hexanone	105-42-0	S16T021660
Tetrachioroethane NGS 100 <3.0 <3.0 n/a	n/a	3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	99	NGS	3-Octanone	106-68-3	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a	n/a	2.7	n/a	n/a	n/a	n/a	<2.7	<2.7	100	NGS	3-Heptanone	106-35-4	S16T021660
Tetrachioroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a n/a n/a n/a nidohioroethane NGS 100 <2.3 <2.3 n/a n/a n/a n/a n/a n/a nidohioroethane NGS 99 <1.7 <1.7 n/a n/a n/a n/a n/a n/a nidohioroethane NGS 99 <1.7 <1.7 n/a n/a n/a n/a n/a n/a nidohioroethane NGS 99 <1.7 <1.7 n/a n/a n/a n/a n/a n/a nidohioroethane NGS 100 <1.8 <1.8 n/a n/a n/a n/a n/a n/a nidohioroethane NGS 100 <1.8 <1.8 n/a n/a n/a n/a n/a n/a n/a n/a nidohioroethane NGS 99 <2.0 2.3 n/a	n/a	1.9	n/a	n/a	n/a	n/a	<1.9	<1.9	93	NGS	3-Buten-2-one	78-94-4	S16T021660
Tetrachioroethane NGS 100 <3.0 <3.0 n/a	n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	96	NGS	2-Methylfuran	534-22-5	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a ichloroethane NGS 100 <2.3	n/a	2.5	n/a	n/a	n/a	n/a	<2.5	<2.5	96	NGS	2-Hexanone	591-78-6	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a ichloroethane NGS 100 <2.3	n/a J	2.6	n/a	n/a	n/a	n/a	2.8	<2.6	98	NGS	2-Heptanone	110-43-0	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a icichloroethane NGS 100 <2.3	r/a J	3.1	n/a	n/a	n/a	n/a	3.4	<3.1	96	NGS	2-Butanone	78-93-3	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	2.2	n/a	n/a	n/a	n/a	<2.2	<2.2	110	NGS	2,5-Dihydrofuran	1708-29-8	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	110	NGS	2,4-Dimethylpyridine	108-47-4	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	8.9	n/a	n/a	n/a	n/a	<8.9	<8.9	100	NGS	1-Propanol	71-23-8	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	9.1	n/a	n/a	n/a	n/a	<9.1	<9.1	98	NGS	1-Heptanol	111-70-6	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	r B/u	4.3	n/a	n/a	n/a	n/a	5.6	<4.3	110	NGS	1-Butanol	71-36-3	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a J	2.0	n/a	n/a	n/a	n/a	2.3	<2.0	99	NGS	1,4-Dioxane	123-91-1	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	4.1	n/a	n/a	n/a	n/a	<4.1	<4.1	100	NGS	1,4-Dichlorobenzene	106-46-7	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	100	NGS	1,3-Dichloropropene (Total)	542-75-6	S16T021660
Tetrachloroethane	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	100	NGS	1,2-Dichloroethane	107-06-2	S16T021660
Tetrachloroethane	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	93	NGS	1,1-Dichloroethene	75-35-4	S16T021660
Tetrachloroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a nichloroethane NGS 100 <2.3	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	99	NGS	1,1-Dichloroethane	75-34-3	S16T021660
Tetrachioroethane NGS 100 <3.0 <3.0 n/a n/a n/a n/a	n/a	2.3	n/a	n/a	n/a	n/a	<2.3	<2.3	100	NGS	1,1,2-Trichloroethane	79-00-5	S16T021660
All with the second sec	n/a	3.0	n/a	n/a	n/a	n/a	<3.0	<3.0	100	NGS	1,1,2,2-Tetrachloroethane	79-34-5	S16T021660
Contract of the Contract of th												VOA #2	VAPOR-TDU VOA #2
Unit STD % Blank Result Duplicate Average RPD % Spk Rec %	Det Limit Cnt Err % Qual Flags	Det Limit	Spk Rec %	RPD %	Average	Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162143

SDG Number: Customer Sample ID: 16-06172-2-IN-BASE Customer Sample ID: 16-06172-2-IN-BASE

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	nk Rec %	Det Limit	Det Limit Cot Err % Oual Flags
VAPOR-TDU VOA #2	U VOA #2											
S16T021660	100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a
S16T021660	123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a
S16T021660	109-74-0	Butanenitrile	NGS	110	2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a
S16T021660	56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a
S16T021660	108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a
S16T021660	75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021660	67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021660	110-82-7	Cyclohexane	NGS	99	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a
S16T021660	124-18-5	Decane	NGS	100	3.3	6.2	n/a	n/a	n/a	n/a	သ	n/a J
S16T021660	64-17-5	Ethanol	NGS	100	3.8	20	n/a	n/a	n/a	n/a	3.7	n/a BJ
S16T021660	141-78-6	Ethyl acetate	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021660	100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a
S16T021660	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021660	110-54-3	Hexane	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a
S16T021660	628-73-9	Hexanenitrile	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021660	126-98-7	Methacrylonitrile	NGS	110	<1.8	2.0	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021660	75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a
S16T021660	91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a
S16T021660	98-95-3	Nitrobenzene	NGS	94	<4.7	5.6	n/a	n/a	n/a	n/a	4.7	n/a J
S16T021660	110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a
S16T021660	107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021660	110-86-1	Pyridine	NGS	100	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a L
S16T021660	100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a
S16T021660	127-18-4	Tetrachloroethene	NGS	100	<1.8	8.6	n/a	n/a	n/a	n/a	1.8	n/a J
S16T021660	108-88-3	Toluene	NGS	110	<2.2	6.9	n/a	n/a	n/a	n/a	2.2	n/a J
S16T021660	79-01-6	Trichloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a
S16T021660	75-69-4	Trichlorofluoromethane	NGS	98	<1.9	6.3	n/a	n/a	n/a	n/a	1.9	n/a J
S16T021660	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a
S16T021660	123-86-4	n-Butyl acetate	NGS	93	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Q - Qualitative J - Estimated

Y Se

E - Outside Calibration Range
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination L - LLS Outside Range Cartridge Evaluation
Data Summary of All Results

Data Summary of A

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Sample Group: 20162143

SDG Number:

S16T021660 S16T021660 Sample# R A# CAS# VAPOR-TDU VOA #2 Customer Sample ID: 16-06172-2-IN-BASE Customer Sample ID: 16-06172-2-IN-BASE 10061-02-6 trans-1,3-Dichloropropene 142-82-5 Analyte n-Heptane NGS Unit STD % 100 Blank <1.6 Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags n/a n/a n/a n/a

C.94

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-A1
Customer Sample ID: 16-06172-2-A1

	1				Detention Time			
Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	~~						
S16T021648			Acetic acid, anhydride with fo	2258-42-6	11.78	NGS	40	40 JNT
S16T021648			1-Propen-2-ol, formate	32978-00-0	14.09	NGS	30	30 JNT
S16T021648			Pentanal	110-62-3	14.32	NGS	40	40 JNT
S16T021648			Nitric oxide	10102-43-9	14.77	NGS	3.6E+03 JNT	TNT
S16T021648			Formamide	75-12-7	14.86	NGS	45	45 JNT
S16T021648			Hexanal	66-25-1	16.69	NGS	. 60	TNL 08
S16T021648			Cyclotetrasiloxane, octamethyl	556-67-2	20.19	NGS	260 JNT	JNT
S16T021648			Dodecane	112-40-3	22.78	NGS	160 JNT	JNT
S16T021648			Decane, 2,4,6-trimethyl-	62108-27-4	22.92	NGS	57	57 JNT
S16T021648			2,6-Dimethyldecane	13150-81-7	23.66	NGS	120 JNT	JNT
S16T021648			Octane, 4-ethyl-	15869-86-0	23.76	NGS	65	65 JNT
S16T021648			Unknown-1		24.07	NGS	260 JT	JT
S16T021648			Undecane, 2,6-dimethyl-	17301-23-4	25.11	NGS	58	58 JNT
S16T021648			Carbamic acid, butylmethyl-, p	54644-61-0	25.68	NGS	47	47 JNT
S16T021648			1,2-Benzisothiazole	272-16-2	26.18	NGS	38	38 JNT
S16T021648			Undecane, 2-methyl-	7045-71-8	26.30	NGS	85	85 JNT
S16T021648			1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.49	NGS	74	74 JNT
S16T021648			Decane, 2,6,8-trimethyl-	62108-26-3	26.88	NGS	49	49 JNT

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

C.95

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Cartridge Evaluation
Data Summary of All Results

SDG Number: Customer Sample ID: 16-06172-2-A2
Customer Sample ID: 16-06172-2-A2

Sample Group: 20162143

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Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flans
VAPOR-TDU VOA #2	VOA #	2	A Company of the Comp					wood ingo
S16T021649			Cyclotetrasiloxane, octamethyl	556-67-2	20.20	NGS	320 JNT	TIN
S16T021649			Dodecane	112-40-3	22.78	NGS	140 JNT	TNL
S16T021649			Decane, 2,4,6-trimethyl-	62108-27-4	22.92	NGS	55	55 JNT
S16T021649			2,6-Dimethyldecane	13150-81-7	23.66	NGS	89	B9 JNT
S16T021649			Octane, 4-ethyl-	15869-86-0	23.76	NGS	90	TNL 08
S16T021649			Unknown-1		24.05	NGS	270 J	זי
S16T021649			Undecane, 2,6-dimethyl-	17301-23-4	25.10	NGS	63	TNL
S16T021649			1,2-Benzisothiazole	272-16-2	26.16	NGS	160 JNT	TNT
S16T021649	7		Undecane, 2-methyl-	7045-71-8	26.26	NGS	66	TNL
S16T021649			Decane, 2,6,8-trimethyl-	62108-26-3	26.83	NGS	31 JNT	TNT

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-B1 Customer Sample ID: 16-06172-2-B1

Sample# R A#	gc Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flans
VAPOR-TDU VOA #2							
S16T021650		Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	210 JNT	JNT
S16T021650		Dodecane	112-40-3	22.79	NGS	140	JNT
S16T021650		Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	48	48 JNT
S16T021650		2,6-Dimethyldecane	13150-81-7	23.66	NGS	99	TNI
S16T021650	-	Octane, 4-ethyl-	15869-86-0	23.76	NGS	120 JNT	TNT
S16T021650		Unknown-1		24.05	NGS	210 JT	J
S16T021650		Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	65	65 JNT
S16T021650		Acetic acid, trifluoro-, 3,7-d	28745-07-5	25.23	NGS	53	53 JNT
S16T021650		Unknown-2		25.83	NGS	48 JT	JT
S16T021650		Methenamine	100-97-0	26.04	NGS	140	140 JNT
S16T021650		1,2-Benzisothiazole	272-16-2	26.15	NGS	130	130 JNT
S16T021650		Undecane, 2-methyl-	7045-71-8	26.25	NGS	74	74 JNT
S16T021650		Decane, 2,6,8-trimethyl-	62108-26-3	26.82	NGS	36	36 JNT

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162143 SDG Number: 19-Aug-2016 11:0553 DSRTICHardcopy 2.7.32 DSR.Jar v. 3.0.12

Customer Sample ID: 16-06172-2-BLANK
Customer Sample ID: 16-06172-2-BLANK

1000							ŀ		
39 JQT	39	NGS	26.44		Unknown-2			1651	S16T02
35 JQT	35	NGS	24.05		Unknown-1			1651	S16T0216
							VOA #2	'APOR-TDU VOA #2	VAF
Qual Flags	Result	Unit	Retention Time (Minutes)	CAS No.	Analyte	QC Type	A#	R	Sample#

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-C1
Customer Sample ID: 16-06172-2-C1

Sample# R A#	OC Tyne	Analyte	CAS No	Retention Time (Minutes)	Unit	Rosult	Oual Flans
VAPOR-TDU VOA #2	#2		el a				
S16T021652		Formamide	75-12-7	13.99	NGS	25	25 JNT
S16T021652		Cyclotetrasiloxane, octamethyl	556-67-2	20.20	NGS	230 JNT	JNT
S16T021652		Dodecane	112-40-3	22.78	NGS	130 JNT	TNT
S16T021652		Decane, 2,4,6-trimethyl-	62108-27-4	22.92	NGS	50	TNL 08
S16T021652		2,6-Dimethyldecane	13150-81-7	23.65	NGS	94 JNT	TNT
S16T021652		Octane, 4-ethyl-	15869-86-0	23.75	NGS	79	TNL 97
S16T021652		Unknown-1		24.05	NGS	290 JT	JT
S16T021652		Undecane, 2,6-dimethyl-	17301-23-4	25.08	NGS	94	94 JNT
S16T021652		Unknown-2		25.83	NGS	94 JT	JT
S16T021652		Methenamine	100-97-0	26.03	NGS	110 JNT	JNT
S16T021652		1,2-Benzisothiazole	272-16-2	26.14	NGS	150 JNT	JNT
S16T021652		Undecane, 2-methyl-	7045-71-8	26.24	NGS	66	TNL 88
S16T021652		1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.43	NGS	31 JNT	JNT
S16T021652		Hexadecane, 2,6,11,15-tetramet	504-44-9	26.80	NGS	34 JNT	JNT

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

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

E - Outside Calibration Range
T - Tentatively Identified Compound

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound NA = Not Analyzed, ND = Not Detected

B - Blank Contamination L - LLS Outside Range

Data Summary of All Results Cartridge Evaluation

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Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-D1
Customer Sample ID: 16-06172-2-D1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T021653			Cyclotetrasiloxane, octamethyl	556-67-2	20.20	NGS	140 JN	TN
S16T021653		7777	Dodecane	112-40-3	22.78	NGS	110 JN	NT
S16T021653			Decane, 2,4,6-trimethyl-	62108-27-4	22.92	NGS	38 JN	TN
S16T021653			2,6-Dimethyldecane	13150-81-7	23.65	NGS	NF 62	TN
S16T021653			Octane, 4-ethyl-	15869-86-0	23.75	NGS	51 JN	TN
16T021653			Unknown-1		24.05	NGS	J 86	7
16T021653			1,2-Benzisothiazole	272-16-2	26.15	NGS	80 JN	4

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Data Summary of All Results Cartridge Evaluation

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-E1
Customer Sample ID: 16-06172-2-E1

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Sample# R	A#	ас Туре	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	AO #	12						
S16T021654			Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	110 JNT	TNT
S16T021654			Dodecane	112-40-3	22.79	NGS	74	74 JNT
S16T021654			Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	27 JNT	TNL
S16T021654			2,6-Dimethyldecane	13150-81-7	23.66	NGS	64 JNT	TNT
S16T021654			Octane, 4-ethyl-	15869-86-0	23.76	NGS	45	45 JNT
S16T021654			Unknown-1		24.06	NGS	170 JT	JT
S16T021654			Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	42 JNT	JIN
S16T021654			1,2-Benzisothiazole	272-16-2	26.16	NGS	TNL 68	JNT
S16T021654			Undecane, 2-methyl-	7045-71-8	26.25	NGS	37 JNT	JNT

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

Sample Group: 20162143 SDG Number:

SDG Number:

Customer Sample ID: 16-06172-2-EFF-BASE
Customer Sample ID: 16-06172-2-EFF-BASE

Sample# R	Ž.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #							
S16T021655			Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	300	300 JNT
S16T021655			Dodecane	112-40-3	22.79	NGS	100	100 JNT
S16T021655			Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	35	35 JNT
S16T021655			2,6-Dimethyldecane	13150-81-7	23.66	NGS	63	63 JNT
S16T021655			Undecanal	112-44-7	23.78	NGS	56	56 JNT
S16T021655			Unknown-1		24.05	NGS	220 J	JT
S16T021655			Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	52	52 JNT
S16T021655			Acetic acid, trifluoro-, 3,7-d	28745-07-5	25.23	NGS	28	28 JNT
S16T021655			1-Octanol, 3,7-dimethyl-	106-21-8	25.83	NGS	27	27 JNT
S16T021655			1,2-Benzisothiazole	272-16-2	26.15	NGS	777	77 JNT -
S16T021655			Undecane, 2-methyl-	7045-71-8	26.25	NGS	31	31 JNT

N - Named TIC
Y - Comment

Q - Qualitative J - Estimated

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E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

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Sample Group: 20162143 SDG Number:

Cartridge Evaluation Data Summary of All Results

Customer Sample ID: 16-06172-2-F1
Customer Sample ID: 16-06172-2-F1

Sample# R	A.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T021656			Formamide	75-12-7	14.87	NGS	47 JNT	JNT
S16T021656			Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	1NL 76	JNT
S16T021656			Dodecane	112-40-3	22.79	NGS	64 JNT	JNT
S16T021656			Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	24 JNT	JUL
S16T021656			2,6-Dimethyldecane	13150-81-7	23.66	NGS	55 JNT	JNT
S16T021656			Octane, 4-ethyl-	15869-86-0	23.76	NGS	39 JNT	JNT
S16T021656			Unknown-1		24.05	NGS	130 J1	ד
S16T021656			Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	38 JNT	JNT
S16T021656			1,2-Benzisothiazole	272-16-2	26.16	NGS	TNL 09	TNT
S16T021656			Undecane, 2-methyl-	7045-71-8	26.25	NGS	30 JNT	NT N

Q - Qualitative J - Estimated

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Cartridge Evaluation
Data Summary of All Results

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SDG Number:
Customer Sample ID: 16-06172-2-G1

Sample Group: 20162143

Customer Sample ID: 16-06172-2-G1
Customer Sample ID: 16-06172-2-G1

Sample# R	A	QC Туре	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	#2						
S16T021657			Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	120	120 JNT
S16T021657			Dodecane	112-40-3	22.79	NGS	98	98 JNT
S16T021657			Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	34	34 JNT
S16T021657			2,6-Dimethyldecane	13150-81-7	23.66	NGS	66	TNL 88
S16T021657			Octane, 4-ethyl-	15869-86-0	23.76	NGS	35	35 JNT
S16T021657			Unknown-1		24.05	NGS	130 J	JT
S16T021657			Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	26	26 JNT
S16T021657				7045-71-8	36 36	NGS	18 JNT	11.00

Data Summary of All Results Cartridge Evaluation

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-H1
Customer Sample ID: 16-06172-2-H1

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Sample# R	4	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	/OA #/	2						
S16T021658			Cyclotrisiloxane, hexamethyl-	541-05-9	16.89	NGS	26	26 JNT
S16T021658			Cyclotetrasiloxane, octamethyl	556-67-2	20.20	NGS	140 JNT	TNT
S16T021658	Ц		Dodecane	112-40-3	22.78	NGS	69	TNL 89
S16T021658			Decane, 2,4,6-trimethyl-	62108-27-4	22.92	NGS	24	24 JNT
S16T021658			2,6-Dimethyldecane	13150-81-7	23.66	NGS	47	47 JNT
S16T021658			Octane, 4-ethyl-	15869-86-0	23.75	NGS	29	29 JNT
S16T021658			Unknown-1		24.05	NGS	140 JT	JT
S16T021658		97	Undecane, 2,6-dimethyl-	17301-23-4	25.08	NGS	41	41 JNT
S16T021658			1,2-Benzisothiazole	272-16-2	26.15	NGS	52	52 JNT
S16T021658			Undecane, 2-methyl-	7045-71-8	26.24	NGS	20	20 JNT

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Sample Group: 20162143 SDG Number:

Customer Sample ID: 16-06172-2-H2
Customer Sample ID: 16-06172-2-H2

-								
Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TOU VOA #2	VOA#	2						
S16T021659			Formamide	75-12-7	14.87	NGS	61	61 JNT
S16T021659			Cyclotetrasiloxane, octamethyl	556-67-2	20.21	NGS	89	TNL 68
S16T021659			Dodecane	112-40-3	22.79	NGS	45	45 JNT
S16T021659			Decane, 2,4,6-trimethyl-	62108-27-4	22.93	NGS	17	TNL 71
S16T021659			2,6-Dimethyldecane	13150-81-7	23.66	NGS	38	38 JNT
S16T021659			Hydroxylamine, O-decyl-	29812-79-1	23.75	NGS	28	28 JNT
S16T021659			Unknown-1		24.05	NGS	r 06	JL
S16T021659			Undecane, 2,6-dimethyl-	17301-23-4	25.09	NGS	38	38 JNT
S16T021659			1,2-Benzisothiazole	272-16-2	26.16	NGS	30	30 JNT

E - Outside Calibration Range
T - Tentatively Identified Compound

B - Blank Contamination L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

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Sample Group: 20162143

Data Summary of All Results

Cartridge Evaluation

SDG Number:

Customer Sample ID: 16-06172-2-IN-BASE Customer Sample ID: 16-06172-2-IN-BASE

\$16T021660 \$16T021660 S16T021660 VAPOR-TDU VOA #2 R A# **QC Туре** Decane, 2,4,6-trimethyl-2,6-Dimethyldecane Octane, 4-ethyl-Undecane, 2-methyl-Unknown-1 Cyclotetrasiloxane, octamethyl Hexanal Decane, 2,6,8-trimethyl-Acetic acid, trifluoro-, 3,7-d Undecane, 2,6-dimethyl-Dodecane Unknown-2 1,2-Benzisothiazole 556-67-2 272-16-2 66-25-1 62108-26-3 28745-07-5 13150-81-7 62108-27-4 CAS No. 56772-25-9 7045-71-8 17301-23-4 15869-86-0 112-40-3 Retention Time (Minutes) 24.05 26.24 23.65 22.93 26.14 25.83 25.22 23,75 20.21 26.80 16.70 NGS Unit Result 350 JT 46 JNT 390 JNT 110 JNT 130 JNT 35 JNT 61 JNT 42 JT 41 JNT 58 JNT 39 JNT 30 JNT 77 JNT JNT Qual Flags

Q - Qualitative J - Estimated

N - Named TIC Y - Comment

E - Outside Calibration Range
T - Tentatively Identified Compound

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

Sample Group: 20162144

Cartridge Evaluation Data Summary of All Results

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	0.0			pulpinano	PAGING	_	by yec %	Det rimit	Sucr
	92	<1.3	<1.3	n/a	n/a	n/a	n/a	4	
	93	4.5	4.5	n/a	n/a	2/2	n/a	1 1	NI cha
	87	<1.2	<1.2	n/a	n/a	n/a	n/a	10	
	78	<1.3	<1.3	n/a	n/a	n/a	n/a	13	n/a LIV
	92	<1.6	^1.6	n/a	n/a	n/a	n/a	1.6	חום טווע
	· n/a	n/a	<1.2	n/a	n/a	n/a	n/a	10	n/a liv
	92	<2.0	<2.0	n/a	n/a	n/a	n/a	20	n/allV
	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/ally
NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8 9	0/21117
NGS	65	<5.6	5.6	n/a	n/a	n/a	n/a	5 6	, ,
NGS	79	^3.0	43.0	n/a	n/a	D/a	n/a	300	11/2
dine	91	43.3	<3.3	n/a	n/a	n/a	n/a	33	n/a IIIY
	92	€2.8	<2.8	n/a	n/a	n/a	n/a	2.8	אנון באח
	82	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	NU E/O
NGS	84	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
NGS	84	<1,2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY
NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY
NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	N/a UY
NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	N/a UY
none NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY
none	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY
NGS	78	4.6	93	n/a	n/a	n/a	n/a	4.3	n/a BLY
NGS	85	<1.8	590	n/a	n/a	n/a	n/a	1.8	n/a EY
NGS	90	<2.6	17	n/a	n/a	n/a	n/a	2.6	n/a Y
NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LUY
NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY
NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY
							NA = Not A	nalyzed, NE	= Not
Q - Qualitative E - Outside Calibration Range	B - Blank Cor	B - Blank Co	ntamination			-	O Dutaido		
1,1,2,2-Tetrachic 1,1,2-Trichloroetha 1,1-Dichloroetha 1,1-Dichloroetha 1,1-Dichloroetha 1,1-Dichloroetha 1,1-Dichloroetha 1,1-Dichloroetha 1,2-Dichloroetha 1,3-Dichloroprop 1,4-Dichlorobenz 1,	ine fine fine fine fine fine fine fine fine fine fine	MGS 92 NGS 93 NGS 93 NGS 93 NGS 93 NGS 94 NGS 95 NGS 96 NGS 96 NGS 88 NGS NGS	Unit STD %	Mint STD Blank Blank STD Blank Blank Blank STD Blank Blank STD Blank STD Blank STD Blank STD Blank STD Blank Contal STD Blank Contal STD STD	Unit STD% Blank Result Duplit Duplit Result Duplit Duplit Result Result Duplit Result Result	Unit	Unit SID% Blank Result Duplicate Average RPD% Infantation hame NGS 92 <1.3	Unit SID % Blank Result Duplicate Average RPD % thane NGS 92 <1.3	

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Sample Group: 20162144

SDG Number:
Customer Sample ID: 16-06173-2-B1
Customer Sample ID: 16-06173-2-B1

						F								S16T021667 62			S16T021667 10	S16T021667 14		S16T021667 12	S16T021667 11	S16T021667 67	S16T021667 75		S16T021667 56	S16T021667 10		S16T021667 10	TDU VO/	Sample# X A# CAS#
	10061-01-5	75-69-4	79-01-6	108-88-3	127-18-4	100-42-5	110-86-1	107-12-0	110-59-8	98-95-3	91-20-3	75-09-2	26-98-7	628-73-9	10-54-3	10-00-9	100-41-4	141-78-6	64-17-5	124-18-5	110-82-7	67-66-3	75-00-3	108-90-7	56-23-5	109-74-0	123-72-8	100-47-0	#2	AS#
	cis-1,3-Dichloropropene	Trichlorofluoromethane	Trichloroethene	Toluene	Tetrachioroethene	Styrene	Pyridine	Propanenitrile	Pentanenitrile	Nitrobenzene	Naphthalene	Methylene Chloride	Methacrylonitrile	Hexanenitrile	Hexane	Furan	Ethylbenzene	Ethyl acetate	Ethanol	Decane	Cyclohexane	Chloroform	Chloroethane	Chlorobenzene	Carbon tetrachloride	Butanenitrile	Butanal	Benzonitrile		Analyte
	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS		Unit
2	91	81	90	91	93	93	110	90	89	91	92	84	88	90	80	77	92	82	79	92	87	93	81	93	90	86	94	91		STD %
	<1.3	<1.6	<1.5	<1.5	<1.6	<1.6	<3.8	<1.4	<1.6	<2.6	<3.7	6.7	<1.6	<1.5	<1.7	<1.6	<1.5	<1.5	<7.4	<2.8	<1.8	1.5	<1.9	<1.5	<1.6	<1.2	<2.1	<1.9		Blank
	<1.3	170	<1.5	2.3	63	1.6	<3.8	2.8	<1.6	7.2	<3.7	<2.7	<1.6	<1.5	<1.7	<1.6	<1.5	<1.5	<7.4	<2.8	. <1.8	<1.5	<1.9	<1.5	<1.6	<1.2	3.2	<1.9		Result
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Result Duplicate
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Average
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	. n/a	n/a	n/a			B/u		Average RPD % Spk Rec
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Spk Rec %
1	1 2	1.6	1.5	1.5	1.6	1.6	3.8	1.4	1.6	2.6	3.7	2.7	1.6	1.5	1.7	1.6	1.5	J.	7.4	2.8	1 8	1.5	1.9	1.5	1.6	1.2	2.1	1.9	103745000	Det Limit
1000	n/s irv	n/a Y	n/a UY	n/a JY	n/a Y	n/a JY	n/a UY	n/a JY	n/a UY	n/a JY	n/a UY	n/a LY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a JY	n/a UY		Det Limit Cnt Err % Qual Flags

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

Q - Qualitative E - Outside Calibration Range N - Named TIC

B - Blank Contamination J - Estimated

a - LCS Outside Range T - Tentatively Identified Compound NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-B1 Customer Sample ID: 16-06173-2-B1

S16T021667 Sample# R A# CAS# S16T021667 VAPOR-TDU VOA #2 10061-02-6 trans-1,3-Dichloropropene 142-82-5 Analyte n-Heptane NGS Unit STD% 90 85 Blank <1.2 Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags <1.2 n/a n/a n/a n/a n/a n/a n/a n/a UY

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Y - Comment

Q - Qualitative E - Outside Calibration Range N - Named TIC

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T - Tentatively Identified Compound

SDG Number: Customer Sample ID: 16-06173-2-BLANK Customer Sample ID: 16-06173-2-BLANK

Sample Group: 20162144

sample# K	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T021668	79-34-5	1,1,2,2-Tetrachioroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a Y
S16T021668	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a Y
S16T021668	75-34-3	1,1-Dichloroethane	NGS	89	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a Y
S16T021668	75-35-4	1,1-Dichloroethene	NGS	81	<1.3	<1.3	n/a	n/a	n/a	n/a	.i.	n/a Y
S16T021668	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T021668	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a Y
S16T021668	106-46-7	1,4-Dichlorobenzene	NGS	93	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a QY
S16T021668	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a Y
S16T021668	71-36-3	1-Butanoi	NGS	86	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a LY
S16T021668	111-70-6	1-Heptanol	NGS	74	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a LQY
S16T021668	71-23-8	1-Propanol	NGS	83	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a Y
S16T021668	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a Y
S16T021668	1708-29-8	2,5-Dihydrofuran	NGS	90	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a Y
S16T021668	78-93-3	2-Butanone	NGS	84	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a Y
S16T021668	110-43-0	2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T021668	591-78-6	2-Hexanone	NGS	84	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a Y
S16T021668	534-22-5	2-Methylfuran	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a Y
S16T021668	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a Y
S16T021668	106-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a Y
S16T021668	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a QY
S16T021668	105-42-0	4-Methyl-2-hexanone	NGS	89	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a Y
S16T021668	108-10-1	4-Methyl-2-Pentanone	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a Υ
S16T021668	67-64-1	Acetone	NGS	71	5.6	<4.3	n/a	n/a	n/a	n/a	4.3	n/a BY
S16T021668	75-05-8	Acetonitrile	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a Y
S16T021668	98-86-2	Acetophenone	NGS	91	<2.6	7.7	n/a	n/a	n/a	n/a	2.6	n/a JQY
S16T021668	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a Y
S16T021668	107-18-6	Allyl Alcohol	NGS	82	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LY
S16T021668	107-05-1	Allyl Chloride	NGS	85	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a Y
S16T021668	71-43-2	Benzene	NGS	92	<1.2	<1.2	n/a	n/a	n/a	2/0	4 2	2/2

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Q - Qualitative E - Outside Calibration Range N - Named TIC

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

B - Blank Contamination J - Estimated

a - LCS Outside Range T - Tentatively Identified Compound

Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-BLANK Customer Sample ID: 16-06173-2-BLANK

VAPOR-TDU VOA #2	U VOA #2		Unit	STD %	Blank	Result	Result Duplicate	Average RPD % Spk Rec	ארט %	Spk Rec %	1	Det Limit	Det Limit Cnt Err % Qual Flags
S16T021668	100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a		n/a			n/a
S16T021668	123-72-8		NGS	92	2.1	<2.1	n/a	n/a	-			n/a n/a	n/a n/a 2.1
S16T021668	109-74-0	Butanenitrile	NGS	87	<1.2	<1.2	n/a	n/a	w		n/a	n/a n/a	n/a n/a 1.2
S16T021668	56-23-5	Carbon tetrachloride	NGS	94	<1.6	<1.6	n/a	n/a	00		n/a	n/a n/a	n/a n/a 1.6
S16T021668	108-90-7	Chlorobenzene	NGS	94	<1.5	<1.5	n/a	n/a	_		n/a	n/a n/a	n/a n/a 1.5
S16T021668	75-00-3	Chloroethane	NGS	85	<1.9	<1.9	n/a	n/a	8		n/a	n/a n/a	n/a n/a 1.9
S16T021668	67-66-3	Chloroform	NGS	95	<1.5	<1.5	n/a	,	₽		n/a	n/a n/a	n/a n/a 1.5
S16T021668	110-82-7	Cyclohexane	NGS	93	<1.8	^1.8	n/a	,	8		n/a	n/a n/a	n/a n/a 1.8
S16T021668	124-18-5	Decane	NGS	87	<2.8	<2.8	n/a		₽a		n/a	n/a n/a	n/a n/a 2.8
S16T021668	64-17-5	Ethanol	NGS	79	<7.4	<7.4	n/a	-	n/a		n/a	n/a n/a	n/a n/a 7.4
S16T021668	141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	1	n/a		n/a	n/a n/a	n/a n/a 1.5
S16T021668	100-41-4	Ethylbenzene	NGS	93	<1.5	<1.5	n/a		n/a		n/a	n/a n/a	n/a n/a 1.5
S16T021668	110-00-9	Furan	NGS	81	<1.6	<1.6	n/a		n/a		n/a	n/a n/a	n/a n/a 1.6
S16T021668	110-54-3	Hexane	NGS	85	<1.7	<1.7	n/a		n/a		n/a	n/a n/a	n/a n/a 1.7
S16T021668	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a		n/a		n/a	n/a n/a	n/a n/a 1.5
S16T021668	126-98-7	Methacrylonitrile	NGS	88	<1.6	<1.6	n/a		₽a		n/a	n/a n/a	n/a n/a 1.6
S16T021668	75-09-2	Methylene Chloride	NGS	89	<2.7	<2.7	n/a		n/a		n/a	n/a n/a	n/a n/a 2.7
S16T021668	91-20-3	Naphthalene	NGS	90	<3.7	<3.7	n/a		n/a	n/a n/a	n/a	n/a	n/a n/a
S16T021668	98-95-3	Nitrobenzene	NGS	93	<2.6	<2.6	n/a		n/a	n/a n/a	n/a	n/a n/a	n/a n/a 2.6
S16T021668	110-59-8	Pentanenitrile	NGS	87	<1.6	<1.6	n/a		n√a	n/a n/a	n/a	n/a n/a	n/a n/a 1.6
S16T021668	107-12-0	Propanenitrile	NGS	87	<1.4	<1.4	n/a		n/a		n/a	n/a n/a	n/a n/a 1.4
S16T021668	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a		n/a	n/a n/a	n/a	n/a	n/a n/a 3.8
S16T021668	100-42-5	Styrene	NGS	95	<1.6	<1.6	n/a		n/a	n/a n/a	n/a	n/a n/a	n/a n/a 1.6
S16T021668	127-18-4	Tetrachloroethene	NGS	94	<1.6	26	n/a		n/a		n/a	n/a n/a	n/a n/a 1.6
S16T021668	108-88-3	Toluene	NGS	92	<1.5	<1.5	n/a		n/a		n/a	n/a n/a	n/a n/a 1.5
S16T021668	79-01-6	Trichloroethene	NGS	91	<1.5	<1.5	n/a		n/a	n/a n/a	n/a	n/a n/a	n/a n/a 1.5
S16T021668	75-69-4		NGS	84	<1.6	<1.6	n/a		n/a	n/a n/a	n/a	n/a n/a	n/a n/a 1.6
S16T021668	10061-01-5	-5 cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a		n/a	n/a n/a	n/a	n/a n/a	n/a n/a 1.3
S16T021668	123-86-4		NGS	82					0/0	n/a n/a	n/a	n/a	2/2

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162144

SDG Number: Customer Sample ID: 16-06173-2-BLANK Customer Sample ID: 16-06173-2-BLANK

Sample# R	A	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % S	pk Rec %	Det Limit	Cnt Err % Qual Fla
VAPOR-TDU VOA #2	V Na1	/OA #2											
S16T021668	L	142-82-5	n-Heptane	NGS	88	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a Y
S16T021668	_	10061-02-6	trans-1 3-Dichloropropene	NGS	8	3	1	2/2					
2101051000		0-20-10001	mana-1, a-Dictionopopopopo	NGO	90	7.15	2.12	n/a	n/a	n/a	n/a	12	n/a Y

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L - LLS Outside Range

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Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-C1 Customer Sample ID: 16-06173-2-C1

VADOD TO	CAS#	5 8	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average RPD % Spk R	RPD %	Spk Rec %	Det Limit Cnt Err % Qual Flags	CntE
VAPOR-TDU VOA #2	# NOV U	2				form 1							- H
S16T021669	79.	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	\neg
S16T021669	79-	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	7
S16T021669	75-	75-34-3	1,1-Dichloroethane	NGS	87	4.2	<1.2	n/a	n/a	n/a	n/a	1.2	+
S16T021669	75	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	+
S16T021669	10	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	1
S16T021669	54:	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	T
S16T021669	100	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	Ť
S16T021669	12:	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	1
S16T021669	71-	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8 :	T
S16T021669	111	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	55 6	T
S16T021669	71-	71-23-8	1-Propanol	NGS	79	<3.0	4.2	n/a	n/a	n/a	n/a	3.0	
S16T021669	100	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	1
S16T021669	170	1708-29-8	2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	
S16T021669	78-	78-93-3	2-Butanone	NGS	82	<1.9	3.0	n/a	n/a	n/a	n/a	1.9	
S16T021669	110	110-43-0	2-Heptanone	NGS	84	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T021669	591	591-78-6	2-Hexanone	NGS	84	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	
S16T021669	534	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	
S16T021669	78-	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	1
S16T021669	106	106-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021669	106	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	T
S16T021669	105	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	T
S16T021669	108	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1,9	<1.9	n/a	n/a	n/a	n/a	1.9	T
S16T021669	67-	67-64-1	Acetone	NGS	78	4.6	430	n/a	n/a	n/a	n/a	4.3	1
S16T021669	75-	75-05-8	Acetonitrile	NGS	85	<1.8	800	n/a	n/a	n/a	n/a	1.8	1
S16T021669	98-	98-86-2	Acetophenone	NGS	90	<2.6	25	n/a	n/a	n/a	n/a	2.6	T
S16T021669	107	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	T
S16T021669	107	107-18-6	Allyl Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	T
S16T021669	107	07-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	1
S16T021669	71-	71-43-2	Benzene	NGS	90	<1.2	41.2	n/a	n/a	ηVa	n/a	12	T

NA = Not Analyzed, ND = Not Detected

Q - Qualitative E - Outside Calibration Range N - Named TIC

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

B - Blank Contamination J - Estimated

a - LCS Outside Range
T - Tentatively Identified Compound

Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-C1 Customer Sample ID: 16-06173-2-C1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T021669	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021669	123-72-8	Butanal	NGS	94	2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a UY	
S16T021669	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	
S16T021669	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021669	108-90-7	Chlorobenzene	NGS	93	<1.5	^1.5	n/a	n/a	n/a	n/a	51	מוש מוא	3
S16T021669	75-00-3	Chloroethane	NGS	81	<1.9	2.0	n/a	n/a	n/a	n/a	19	n/a IV	
S16T021669	67-66-3	Chloroform	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	J	ח/פווץ	3
S16T021669	110-82-7	Cyclohexane	NGS	87	<1.8	^1.8	n/a	n/a	n/a	n/a	20 0	n/a UV	
S16T021669	124-18-5	Decane	NGS	92	<2.8	2.8	n/a	n/a	n/a	n/a	28	n/a IV	
S16T021669	64-17-5	Ethanol	NGS	79	<7.4	130	n/a	n/a	n/a	n/a	7.4	n/a Y	
S16T021669	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021669	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021669	110-00-9	Furan	NGS	777	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021669	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021669	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021669	126-98-7	Methacrylonitrile	NGS	88	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021669	75-09-2	Methylene Chloride	NGS	84	6.7	4.2	n/a	n/a	n/a	n/a	2.7	n/a BJLY	4
S16T021669	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY	
S16T021669	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a UY	
S16T021669	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021669	107-12-0	Propanenitrile	NGS	90	<1,4	5.7	n/a	n/a	n/a	n/a	1.4	n/a JY	
S16T021669	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a UY	
S16T021669	100-42-5	Styrene	NGS	93	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021669	127-18-4	Tetrachloroethene	NGS	93	<1.6	59	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021669	108-88-3	Toluene	NGS	91	<1.5	2.0	n/a	n/a	n/a	n/a	1.5	n/a JY	
S16T021669	79-01-6	Trichloroethene	NGS	90	<1.5	. <1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021669	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	240	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021669	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021669	123-86-4	n-Butyl acetate	NGS	84	<u><1.4</u>	<1.4	n/a	n/a	n/a	ala	1 4	7/1 2/0	

B - Blank Contamination J - Estimated

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144 SDG Number:

VAPOR-TDU VOA #2	U VOA #2											
S16T021669	142-82-5	n-Heptane	NGS	85	<1.4	<1.4	n/a	n/a	n/a	n/a	14	n/alily
CACTORION								211.00	1110	1110	1.4	IV BVI
8991701918	10061-02-6	trans-1,3-Dichloropropene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162144
SDG Number:
Customer Sample ID: 16-06173-2-D1
Customer Sample ID: 16-06173-2-D1

591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8 98-86-2 107-13-1 107-18-6 107-05-1	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8 98-86-2 107-13-1	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8 98-86-2 107-13-1	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8 98-86-2	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-64-1	591-78-6 534-22-5 78-94-4 106-35-4 105-42-0 108-10-1	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0	591-78-6 534-22-5 78-94-4 106-35-4 106-68-3	591-78-6 534-22-5 78-94-4 106-35-4	591-78-6 534-22-5 78-94-4	591-78-6	591-78-6		S16T021670 110-43-0 12-1	78-93-3	S16T021670 1708-29-8 2,5	108-47-4	S16T021670 71-23-8 1-F	S16T021670 111-70-6 1-F	71-36-3	S16T021670 123-91-1 1,4	S16T021670 106-46-7 1,4	S16T021670 542-75-6 1,3	107-06-2	S16T021670 75-35-4 1,1	75-34-3	79-00-5		VAPOR-TDU VOA #2	#	
3-Heptanone 3-Octanone 4-Methyl-2-hexanone 4-Methyl-2-Pentanone Acetone Acetonitrile Acetophenone Acrylonitrile Altyl Alcohol Allyl Chloride	leptanone Actanone flethyl-2-hexanone flethyl-2-Pentanone atone stonitrile stophenone ylonitrile yl Alcohol	leptanone Actanone fethyl-2-hexanone fethyl-2-Pentanone stone stone stone stone stophenone stophenone	leptanone Octanone flethyl-2-hexanone flethyl-2-Pentanone stone stonitrile stophenone	leptanone Octanone flethyl-2-hexanone flethyl-2-Pentanone etonitrile	leptanone >ctanone Aethyl-2-hexanone Aethyl-2-Pentanone etone	leptanone Votanone Methyl-2-hexanone Methyl-2-Pentanone	leptanone Octanone Methyl-2-hexanone	leptanone Octanone	leptanone		3-Buten-2-one	2-Methylfuran	2-Hexanone	2-Heptanone	2-Butanone	2,5-Dihydrofuran	2,4-Dimethylpyridine	1-Propanol	1-Heptanol	1-Butanol	1,4-Dioxane	1,4-Dichlorobenzene	1,3-Dichloropropene (Total)	,2-Dichloroethane	1,1-Dichloroethene	1,1-Dichloroethane	1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane		Analyte	
NGS NGS NGS NGS	NGS NGS NGS	NGS NGS	NGS NGS	NGS NGS	NGS	NGS		NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS		Unit	
81		75	88	90	85	78	87	88	88	87	83	86	84	82	82	92	91	79	65	83	91	92	n/a	92	78	87	93	92		STD %	
10.0	200	<3.9	<1.7	<2.6	<1.8	4.6	<1.9	<1.3	<2.4	<1.5	<1.7	<1.9	<1.2	<1.6	<1.9	<2.8	<3.3	<3.0	<5.6	<8.9	<1.7	<2.0	n/a	<1.6	<1.3	<1.2	41.5	<1.3		Blank	
	<2.8	<3.9	<1.7	26	1.5E+04	190	<1.9	<1.3	<2.4	<1.5	<1.7	<1.9	<1.2	<1.6	2.1	<2.8	<3.3	<3.0	<5.6	<8.9	<1.7	<2.0	<1.2	<1.6	<1.3	<1.2	<1.5	<1.3		Result	
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Result Duplicate	
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	- 1	\neg	
-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n√a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		RPD %	
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Average RPD % Spk Rec %	
-	28	3.9	1.7	2.6	1.8	4.3	1.9	1.3	2.4	1.5	1.7	1.9	1.2	1.6	1.9	2.8	33	3.0	55 65	8.9	17	20	1.2	50 0	13	1.2	1.5	1.3		Det Limit	
	n/a I IY	n/a LUY	n/a UY	n/a Y	n/a EY	n/a BLY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY			n/a JY													n/a UY		Det Limit Cnt Err % Qual Flags	

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

Q - Qualitative
E - Outside Calibration Range
N - Named TIC

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B - Blank Contamination J - Estimated

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Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-D1 Customer Sample ID: 16-06173-2-D1

VAPOR-TDU VOA #2	N VC)A #2								Ì			
S16T021670	H	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a		1.9	n/a UY
S16T021670		123-72-8	Butanal	NGS	94	2.1	<2.1	n/a	n/a			.,	n/a UY
S16T021670		109-74-0	Butanenitrile	NGS	86	<1.2	4.2	n/a	n/a		n/a		n/a UY
S16T021670	П	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<u><1.6</u>	n/a	n/a	٦			n/a UY
S16T021670		108-90-7	Chlorobenzene	NGS	93	<1.5	<1.5	n/a	n/a	T			
S16T021670		75-00-3	Chloroethane	NGS	81	<1.9	<1.9	n/a	n/a	1			
S16T021670		67-66-3	Chloroform	NGS	93	<1.5	<1.5	n/a	n/a	П		1.5	
S16T021670		110-82-7	Cyclohexane	NGS	87	<1.8	41.8	n/a	n/a				
S16T021670	П	124-18-5	Decane	NGS	92	<2.8	<2.8	n/a	n/a	n/a			n/a UY
S16T021670		64-17-5	Ethanol	NGS	79	<7.4	110	n/a	n/a	٦			n/a Y
S16T021670	Г	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a			1.5	n/a UY
S16T021670	Г	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a				n/a UY
S16T021670	Г	110-00-9	Furan	NGS	777	<1.6	<1.6	n/a	n/a				n/a UY
S16T021670	T	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a					n/a UY
S16T021670	Т	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a					n/a UY
S16T021670		126-98-7	Methacrylonitrile	NGS	88	<1.6	10	n/a	n/a				n/a JY
S16T021670	Г	75-09-2	Methylene Chloride	NGS	84	6.7	7.9	n/a	n/a				n/a BJLY
S16T021670	Г	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a				n/a UY
S16T021670	Г	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a			2.6	n/a UY
S16T021670	Г	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a			n/a UY
S16T021670	Г	107-12-0	Propanenitrile	NGS	90	<1.4	7.6	n/a	n/a	n/a			n/a JY
S16T021670	Г	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a			n/a UY
S16T021670	Г	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a			n/a UY
S16T021670		127-18-4	Tetrachloroethene	NGS	93	<1.6	57	n/a	n/a	n/a	n/a		n/a Y
S16T021670	Т	108-88-3	Toluene	NGS	91	<1.5	1.9	n/a	n/a	n/a		1.5	n/a JY
S16T021670	T	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a			n/a UY
S16T021670	Г	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	120	n/a	n/a	n/a			n/a Y
S16T021670		10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a			n/a UY
S16T021670	Ī	123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	n/a			און פוח

U - Less Than Detection Limit L - LLS Outside Range Y - Comment

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Sample Group: 20162144 SDG Number:

Cartridge Evaluation
Data Summary of All Results

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Customer Sample ID: 16-06173-2-D1 Customer Sample ID: 16-06173-2-D1

Sample# R A#	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk	pk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	OA #2											
S16T021670	142-82-5	n-Heptane	NGS	85	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a UY
S16T021670	10061-02-6	trans-1,3-Dichloropropene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144
SDG Number:
Customer Sample ID: 16

Customer Sample ID: 16-06173-2-E1 Customer Sample ID: 16-06173-2-E1

Sample# R	A# CAS#	AS#	Analyte	Unit	% OTS	Blank	Result	Result Dunilcate Average BDD % Sak Bor %	Average	% CGG	Cat Day of	Dot I imit	Cat Early Out I Elem
VAPOR-TDU VOA #2	NOV US	#2			0.00				- Barel	0	Opra March	200	Contract of And Liebs
S16T021671	79	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/aluy
S16T021671	79	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021671	17:	75-34-3	1,1-Dichloroethane	NGS	87	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY
S16T021671	7:	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	4.3	n/a	n/a	n/a	n/a	1.3	n/a UY
S16T021671	110	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021671	5	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	1.5	n/a	n/a	n/a	n/a	1.2	n/a Y
S16T021671	10	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a UY
S16T021671	12	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
S16T021671	7.	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a LUY
S16T021671	1.	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a LUYa
S16T021671	7:	71-23-8	1-Propanol	NGS	79	<3.0	4.9	n/a	n/a	n/a	n/a	3.0	n/a JY
S16T021671	10	08-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a UY
S16T021671	-11	708-29-8	2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY
S16T021671	78	78-93-3	2-Butanone	NGS	82	<1.9	2.2	n/a	n/a	n/a	n/a	1.9	n/a JY
S16T021671	-	110-43-0	2-Heptanone	NGS	84	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021671	55	591-78-6	2-Hexanone	NGS	84	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY
S16T021671	5	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY
S16T021671	78	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
S16T021671	10	06-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021671	10	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a UY
S16T021671	100	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY
S16T021671	10	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY
S16T021671	6	67-64-1	Acetone	NGS	78	4.6	450	n/a	n/a	n/a	n/a	4.3	n/a BELY
S16T021671	7:	75-05-8	Acetonitrile	NGS	85	<1.8	530	n/a	n/a	n/a	n/a	1.8	n/a EY
S16T021671	98	98-86-2	Acetophenone	NGS	90	<2.6	12	n/a	n/a	n/a	n/a	2.6	n/a Y
S16T021671	100	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
S16T021671	10	107-18-6	Allyl Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LUY
S16T021671	10	107-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY
S16T021671	7.	71-43-2	Benzene	NGS	90	<1.2	1.4	n/a	n/a	2/2	n/a	10	n/a IV

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Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-E1 Customer Sample ID: 16-06173-2-E1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU VOA #2	J VOA #2												
S16T021671	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021671	123-72-8	Butanal	NGS	94	2.1	2.1	n/a	n/a	n/a	n/a	2.1	n/a UY	
S16T021671	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	N/a UY	
S16T021671	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021671	108-90-7	Chlorobenzene	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	75
S16T021671	75-00-3	Chloroethane	NGS	82	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021671	67-66-3	Chloroform	NGS	93	<1.5	2.0	n/a	n/a	n/a	n/a	1.5	n/a JY	
S16T021671	110-82-7	Cyclohexane	NGS	87	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a UY	
S16T021671	124-18-5	Decane	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	46
S16T021671	64-17-5	Ethanol	NGS	79	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	NO B/m	
S16T021671	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021671	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	22
S16T021671	110-00-9	Furan	NGS	77	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021671	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	200
S16T021671	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	1000
S16T021671	126-98-7	Methacrylonitrile	NGS	88	<1.6	5.3	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021671	75-09-2	Methylene Chloride	NGS	84	6.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a LUY	
S16T021671	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY	
S16T021671	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a UY	
S16T021671	110-59-8	Pentanenitrile	NGS	89	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021671	107-12-0	Propanenitrile	NGS	90	<1.4	14	n/a	n/a	n/a	n/a	1.4	n/a Y	
S16T021671	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a UY	
S16T021671	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	~
S16T021671	127-18-4	Tetrachloroethene	NGS	93	<1.6	42	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021671	108-88-3	Toluene	NGS	91	<1.5	1.5	n/a	n/a	n/a	n/a	1.5	n/a JY	
S16T021671	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021671	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	240	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021671	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021671	123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	N/a UY	2011

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Sample Group: 20162144 SDG Number:

Cartridge Evaluation
Data Summary of All Results

Cust	lomer Sample I Istomer Sampl	Customer Sample ID: 16-06173-2-E1 Customer Sample ID: 16-06173-2-E1										
Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate Average RPD % Spk Re	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TI	VAPOR-TDU VOA #2							1000000				
S16T021671	142-82-5	n-Heptane	NGS	85	<1.4	<1.4	n/a	n/a	n/a	n/a	14	niality
S16T021671	10061-02-6	10061-02-6 trans-1,3-Dichloropropene	NGS	90	412	1.5	n/a	n/a	n/a	n/a	3	n/o IV

Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-EFF-BASE Customer Sample ID: 16-06173-2-EFF-BASE

		2/9/20/9/9								S16T021672		S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672	S16T021672		S16T021672	S16T021672	S16T021672	VAPOR-TDU VOA #2	Sample# R A#	
	107-05-1	107-18-6	107-13-1	98-86-2	75-05-8	67-64-1	108-10-1	105-42-0	106-68-3	106-35-4	78-94-4	534-22-5	591-78-6	110-43-0	78-93-3	1708-29-8	108-47-4	71-23-8	111-70-6	71-36-3	123-91-1	106-46-7	542-75-6	107-06-2	75-35-4	75-34-3	79-00-5	79-34-5	A #2	A# CAS#	
	Allyl Chloride	Allyl Alcohol	Acrylonitrile	Acetophenone	Acetonitrile	Acetone	4-Methyl-2-Pentanone	4-Methyl-2-hexanone	3-Octanone	3-Heptanone	3-Buten-2-one	2-Methylfuran	2-Hexanone	2-Heptanone	2-Butanone	2,5-Dihydrofuran	2,4-Dimethylpyridine	1-Propanol	1-Heptanol	1-Butanol	1,4-Dioxane	1,4-Dichlorobenzene	1,3-Dichloropropene (Total)	1,2-Dichloroethane	1,1-Dichloroethene	1,1-Dichloroethane	1,1,2-Trichloroethane	1,1,2,2-Tetrachloroethane		Analyte	
	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS	NGS		Unit	
3	81	75	88	90	85	78	87	88	88	87	83	86	84	84	82	92	91	79	65	83	91	92	n/a	92	78	87	93	92		STD %	
1	<2.8	<3.9	<1.7	<2.6	<1.8	4.6	<1.9	<1.3	<2.4	<1.5	<1.7	<1.9	<1.2	<1.6	<1.9	<2.8	<3.3	<3.0	<5.6	<8.9	<1.7	<2.0	n/a	<1.6	<1.3	<1.2	<1.5	<1.3		Blank	
	<2.8	<3.9	<1.7	9.9	250	44	<1.9	<1.3	<2.4	<1.5	<1.7	<1.9	<1.2	<1.6	2.5	<2.8	<3.3	3.6	<5.6	<8.9	<1.7	<2.0	<1.2	<1.6	<1.3	41.2	4.5	<1.3		Result	
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Result Duplicate Average RPD % Spk Rec	
100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	e/u	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Average	
11/0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		RPD %	
11/0	0/0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		Spk Rec %	
2.0	200	39	1.7	2.6	1.8	4.3	1.9	1.3	2.4	1.5	1.7	1.9	1.2	1.6	1,9	2.8	3.3	3.0	5.6	8.9	1.7	2.0	1.2	1.6	1.3	1.2	1.5	1.3		Det Limit	
TOBIN	110	n/a LUY	n/a UY	n/a JY	n/a Y	n/a BLY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a UY	n/a JY	n/a UY	n/a UY	n/a JY	n/a LUYa	n/a LUY							T	n/aluy		Det Limit Cnt Err % Qual Flags	

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Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-EFF-BASE

Sample# R	A# CAS#	R A# CAS# Analyte	Unit	otn %	Blank	Boeult	Dunlicato	1	2000	2	2	
VAPOR-TDU VOA #2	U VOA #2		-					in diag		of the second	See Time City of Magic Light	CIL CIL
S16T021672	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	19	n/ally
S16T021672	123-72-8	Butanal	NGS	94	2.1	<2.1	n/a	n/a	n/a	n/a	21	n/a LIV
S16T021672	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	12	מון מער
S16T021672	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021672	108-90-7	Chlorobenzene	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	- in	n/a UY
S16T021672	75-00-3	Chloroethane	NGS	81	<1.9	<1.9	n/a	n/a	n/a	n/a	1 0	חלפונוע
S16T021672	67-66-3	Chloroform	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021672	110-82-7	Cyclohexane	NGS	87	<1.8	<1.8	n/a	n/a	n/a	n/a	1 0	n/a liv
S16T021672	124-18-5	Decane	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	28	חלם נוע
S16T021672	64-17-5	Ethanol	NGS	79	<7.4	20	n/a	n/a	n/a	n/a	7.4	n/a JY
S16T021672	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021672	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021672	110-00-9	Furan	NGS	777	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021672	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY
S16T021672	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021672	126-98-7	Methacrylonitrile	NGS	88	<1.6	6.0	n/a	n/a	n/a	n/a	1.6	η/a JY
S16T021672	75-09-2	Methylene Chloride	NGS	84	6.7	6.1	n/a	n/a	n/a	n/a	2.7	n/a BJLY
S16T021672	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY
S16T021672	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a UY
S16T021672	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021672	107-12-0	Propanenitrile	NGS	90	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a UY
S16T021672	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a UY
S16T021672	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021672	127-18-4	Tetrachloroethene	NGS	93	<1.6	54	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T021672	108-88-3	Toluene	NGS	91	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a JY
S16T021672	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021672	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	4.5	n/a	n/a	n/a	n/a	1.6	n/a JY
S16T021672	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY
S16T021672	123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	olo	26	-		

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B - Blank Contamination J - Estimated

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a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

Q - Qualitative E - Outside Calibration Range N - Named TIC

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Cartridge Evaluation
Data Summary of All Results

25 - Aug - 2016 9:08:06 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample Group: 20162144

	-							1					
n/a UY	1.2	n/a	n/a	n/a	n/a	1.2	4.2	90	NGS	trans-1,3-Dichloropropene	10061-02-6	1/2	5161021672
n/a UY	1.4	n/a	n/a	n/a	n/a	<1.4	<1.4	85	NGS	n-Heptane	1	5/2	5161021672
											VAPOR-TDU VOA #2	DR-TDU	VAP
Cnt Err % Qual I	Det Limit	Spk Rec %	RPD %	Average	Result Duplicate Average RPD % Spk Re	Result	Blank	STD %	Unit	Analyte	A# CAS#	7	Sample#
									m	Customer Sample ID: 16-06173-2-EFF-BASE	omer Sample	Cus	
										Customer Sample ID: 16-06173-2-EFF-BASE	mer Sample II	Custo	
											SDG Number:	G Nu	S

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-F1
Customer Sample ID: 16-06173-2-F1

Sample# R	A# CAS#	Analyte	Unit	240.00	Blank	Donalit	Boselle Dunlicato Accesso BBD 8/ Sat Book	*	200	2	2		
VAPOR-TDU VOA #2	U VOA #2			212			,			and the second		Six Eli a Macci i also	og ringe
S16T021673	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	<u>1</u> ن	n/a UY	
S16T021673	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021673	75-34-3	1,1-Dichloroethane	NGS	87	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a QUY	Y
S16T021673	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a QUY	Y
S16T021673	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a QUY	7
S16T021673	542-75-6	1,3-Dichloropropene (Total)	NGS	s/n	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	
S16T021673	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a UY	1
S16T021673	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a QUY	YU
S16T021673	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a LQUY	Ĭ
S16T021673	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a LUYa	ΙΥa
S16T021673	71-23-8	1-Propanol	NGS	79	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a QUY	۲
S16T021673	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a UY	
S16T021673	1708-29-8	2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a QUY	Y
S16T021673	78-93-3	2-Butanone	NGS	82	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a QY	
S16T021673	110-43-0	2-Heptanone	NGS	84	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021673	591-78-6	2-Hexanone	NGS	84	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	
S16T021673	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a QUY	۲
S16T021673	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a QUY	7
S16T021673	106-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021673	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a UY	
S16T021673	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021673	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a QUY	۲
S16T021673	67-64-1	Acetone	NGS	78	4.6	560	n/a	n/a	n/a	n/a	4.3	n/a BELQY	LQY
S16T021673	75-05-8	Acetonitrile	NGS	85	<1.8	510	n/a	n/a	n/a	n/a	1.8	n/a EQY	*
S16T021673	98-86-2	Acetophenone	NGS	90	<2.6	7.7	n/a	n/a	n/a	n/a	2.6	Na JY	
S16T021673	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a QUY	7
S16T021673	107-18-6	Allyl Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LQUY	Ϋ́
S16T021673	107-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	N/a QUY	۲
S16T021673	71-43-2	Benzene	NGS	90	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a JQY	¥

NA = Not Analyzed, ND = Not Detected

Y - Comment U - Less Than Detection Limit L - LLS Outside Range

Q - Qualitative E - Outside Calibration Range N - Named TIC

B - Blank Contamination J - Estimated

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C.126

Sample Group: 20162144

SDG Number:
Customer Sample ID: 16-06173-2-F1
Customer Sample ID: 16-06173-2-F1

n/a UY	1.4	n/a	n/a	n/a	n/a	<1.4	<1.4	28	NGS	n-Butyl acetate	123-86-4		S16T021673
n/a QUY	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	91	NGS	cis-1,3-Dichloropropene	10061-01-5	H	S16T021673
n/a QY	1.6	n/a	n/a	n/a	n/a	310	<1.6	81	NGS	Trichlorofluoromethane	75-69-4	H	S16T021673
n/a QUY	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	90	NGS	Trichloroethene	79-01-6	H	S16T021673
n/a UY	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	91	NGS	Toluene	108-88-3	L	S16T021673
n/a Y	1.6	n/a	n/a	n/a	n/a	23	<1.6	93	NGS	Tetrachloroethene	127-18-4	H	S16T021673
n/a UY	1.6	n/a	n/a	n/a	, n/a	<1.6	<1.6	93	NGS	Styrene	100-42-5	L	S16T021673
n/a QUY	3.8	n/a	n/a	n/a	n/a	<3.8	<3.8	110	NGS	Pyridine	110-86-1	H	S16T021673
n/a JQY	1.4	n/a	n/a	n/a	n/a	12	<1.4	90	NGS	Propanenitrile	107-12-0	H	S16T021673
n/a UY	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	89	NGS	Pentanenitrile	110-59-8		S16T021673
n/a UY	2.6	n/a	n/a	n/a	n/a	<2.6	<2.6	91	NGS	Nitrobenzene	98-95-3	H	S16T021673
	3.7	n/a	n/a	n/a	e/u	<3.7	<3.7	92	NGS	Naphthalene	91-20-3	H	S16T021673
n/a BJLQY	2.7	n/a	n/a	n/a	n/a	2.8	6.7	84	NGS	Methylene Chloride	75-09-2		S16T021673
n/a JQY	1.6	n/a	n/a	n/a	n/a	2.3	<1.6	88	NGS	Methacrylonitrile	126-98-7	H	S16T021673
	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	90	NGS	Hexanenitrile	628-73-9	L	S16T021673
AND B/W	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	80	NGS	Hexane	110-54-3	-	S16T021673
n/a QUY	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	77	NGS	Furan	110-00-9	H	S16T021673
	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	92	NGS	Ethylbenzene	100-41-4		S16T021673
N/a QUY	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	82	NGS	Ethyl acetate	141-78-6	H	S16T021673
n/a QUY	7.4	n/a	n/a	n/a	n/a	<7.4	<7.4	79	NGS	Ethanol	64-17-5		S16T021673
n/a UY	2.8	n/a	n/a	n/a	n/a	<2.8	<2.8	92	NGS	Decane	124-18-5	L	S16T021673
n/a QUY	1.8	n/a	n/a	n/a	n/a	<1.8	<1.8	87	NGS	Cyclohexane	110-82-7	H	S16T021673
n/a QUY	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	93	NGS	Chloroform	67-66-3		S16T021673
n/a QUY	1.9	n/a	n/a	n/a	n/a	<1.9	<1.9	81	NGS	Chloroethane	75-00-3		S16T021673
n/a UY	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	93	NGS	Chlorobenzene	108-90-7		\$16T021673
n/a QUY	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	90	NGS	Carbon tetrachloride	56-23-5		S16T021673
	1.2	n/a	n/a	n/a	n/a	<1.2	<1.2	86	NGS	Butanenitrile	109-74-0	_	S16T021673
n/a QUY	2.1	n/a	n/a	n/a	n/a	<2.1	<2.1	94	NGS	Butanal	123-72-8		S16T021673
n/a UY	1.9	n/a	n/a	n/a	n/a	<1.9	<1.9	91	NGS	Benzonitrile	100-47-0	H	S16T021673
											OA #2	ע טםו	VAPOR-TDU VOA #2
Det Limit Cnt Err % Qual Flags	Det Limit	Average RPD % Spk Rec %	RPD %	Average	Result Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	4	Sample# R

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-1 m

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DSR.Jar v. 3.0.12

25 - Aug - 2016 9:08:06 DSRHardcopyWOLimits 3.0.11b

Sample Group: 20162144 SDG Number:

S16T021673 S16T021673

Sample# R A# CAS# VAPOR-TDU VOA #2 Customer Sample ID: 16-06173-2-F1 Customer Sample ID: 16-06173-2-F1 142-82-5 n-Heptane 10061-02-6 trans-1,3-Dichloropropene Analyte NGS Unit STD % 90 85 Blank 1.2 Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags <1.2 <1.4 n/a n/a n/a

n/a

n/a

n/a

1.2

n/a QUY

Cartridge Evaluation
Data Summary of All Results

Page: 21

B - Blank Contamination
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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-G1 Customer Sample ID: 16-06173-2-G1

VAPOR-TDU VOA #2	N NO	OA #2												
S16T021674	\dashv	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	υγ
\$16T021674	-	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	n/a	n/a	n/a		1.5	n/a UY	ΥU
S16T021674		75-34-3	1,1-Dichloroethane	NGS	87	<1.2	<1.2	n/a	n/a	n/a		1.2	n/a UY	Y
S16T021674	\dashv	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	4.3	n/a	n/a	n/a		1.3	n/a UY	YU
S16T021674		107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a		1.6	n/a UY	YU
S16T021674		542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a		1.2	n/a UY	Y
S16T021674	\dashv	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a		2.0	n/a UY	Y
S16T021674	Н	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a		1.7	n/a UY	ΥV
S16T021674	-	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a		8.9	n/a	n/a LUY
S16T021674	Н	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a LUYa
S16T021674		71-23-8	1-Propanol	NGS	79	<3.0	<3.0	n/a	n/a	n/a		3.0	n/a UY	Y
S16T021674	-	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a UY	YU
S16T021674	-	1708-29-8	2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	п/a		2.8	n/a UY	VΥ
S16T021674	Н	78-93-3	2-Butanone	NGS	82	<1.9	<1.9	n/a	n/a	n/a		1.9	N/a UY	VΥ
S16T021674	_	110-43-0	2-Heptanone	NGS	84	<1.6	<1.6	n/a	n/a	n/a		1.6	n/a UY	Y
S16T021674	-	591-78-6	2-Hexanone	NGS	84	<1.2	<1.2	n/a	n/a	n/a		1.2	n/a UY	VΥ
S16T021674	_	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	υγ
S16T021674	-	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a		1.7	n/a UY	Y
S16T021674	Н	106-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	п/а	n/a		1.5	N/a UY	VΥ
S16T021674	_	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a		2.4	n/a UY	VΥ
S16T021674	-	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	VΥ
S16T021674	H	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1.9	<1.9	n/a	n/a	n/a		1.9	n/a UY	VΥ
S16T021674	-	67-64-1	Acetone	NGS	78	4.6	950	n/a	n/a	n/a	n/a	4.3	n/a	n/a BELY
S16T021674		75-05-8	Acetonitrile	NGS	85	<1.8	960	n/a	n/a	n/a		1.8	n/a EY	FY
S16T021674	_	98-86-2	Acetophenone	NGS	90	<2.6	5.8	n/a	n/a	n/a		2.6	n/a JY	JY
S16T021674	_	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a		1.7	N/a UY	UY
S16T021674	_	107-18-6	Aliyi Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a		3.9	n/a	n/a LUY
S16T021674	_	107-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	Y
S16T021674		71-43-2	Benzene	NGS	90	<1.2	1.3	n/a	n/a	n/a		1.2	n/a JY	Y

Y - Comment
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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144
SDG Number:
Customer Sample ID: 16-06173-2-G1
Customer Sample ID: 16-06173-2-G1

oampie# K	AF CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average RPD % Spk Rec	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	J VOA #2			The second second									
S16T021674	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	7
S16T021674	123-72-8	Butanai	NGS	94	<2.1	21	n/a	n/a	n/a	n/a	21	n/a UY	<
S16T021674	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	× :
S16T021674	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	16	חומ טיי	<
S16T021674	108-90-7	Chlorobenzene	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	ח כ	n/a IIIV	<
S16T021674	75-00-3	Chloroethane	NGS	81	<1.9	<1.9	n/a	n/a	n/a	n/a	0 0	n/allv	<
S16T021674	67-66-3	Chloroform	NGS	93	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	Na IV	1
S16T021674	110-82-7	Cyclohexane	NGS	87	<1.8	^1.8	n/a	n/a	n/a	n/a	1 0	n/allv	\
S16T021674	124-18-5	Decane	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	<
S16T021674	64-17-5	Ethanol	NGS	79	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a UY	×
S16T021674	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	۲ .
S16T021674	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	4
S16T021674	110-00-9	Furan	NGS	777	<1.6	<1.6	n/a	n/a	n/a	в/п	1.6	n/a UY	~
S16T021674	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	^
S16T021674	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	<u>۲</u>
S16T021674	126-98-7	Methacrylonitrile	NGS	88	<1.6	2.9	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021674	75-09-2	Methylene Chloride	NGS	84	6.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a LUY	٧٧
S16T021674	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY	×
S16T021674	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a UY	*
S16T021674	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	*
S16T021674	107-12-0	Propanenitrile	NGS	90	<1.4	21	n/a	n/a	n/a	n/a	1.4	n/a Y	
S16T021674	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a UY	۲
S16T021674	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	×
S16T021674	127-18-4	Tetrachloroethene	NGS	93	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021674	108-88-3	Toluene	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	۲
S16T021674	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	<u>۲</u>
S16T021674	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	310	n/a	n/a	n/a	n/a	1.6	n/a Y	
S16T021674	10061-01-5	-5 cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	1
S16T021674	123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	14	NII elo	\$

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

Q - Qualitative E - Outside Calibration Range N - Named TIC

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected

a - LCS Outside Range T - Tentatively Identified Compound

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-G1 Customer Sample ID: 16-06173-2-G1

S16T021674 S16T021674 Sample# R A# CAS# VAPOR-TDU VOA #2 142-82-5 142-82-5 n-Heptane 10061-02-6 trans-1,3-Dichloropropene Analyte NGS NGS Unit STD % 90 85 Blank 12 4 Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags 1.2 n/a n/a n/a n/a n/a n/a n/a 1.2 n/a UY n/a UY

B - Blank Contamination
J - Estimated

Y - Comment
U - Less Than Detection Limit
L - LLS Outside Range

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a - LCS Outside Range T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

C.131

Sample Group: 20162144 SDG Number: Customer Sample ID: 16-06173-2-H1 Customer Sample ID: 16-06173-2-H1

Ϋ́	n/a JY	1.2	n/a	n/a	n/a	n/a	6.4	<1.2	90	NGS	Benzene	71-43-2	S16T021675
VΥ	n/a UY	2.8	n/a	n/a	n/a	n/a	<2.8	<2.8	81	NGS	Allyl Chloride	107-05-1	S16T021675
n/a LUY	n/a	3.9	n/a	n/a	n/a	n/a	<3.9	<3.9	75	NGS	Allyl Alcohol	107-18-6	S16T021675
VV	n/a UY	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	88	NGS	Acrylonitrile	107-13-1	S16T021675
٦Y	n/a JY	2.6	n/a	n/a	n/a	n/a	7.7	<2.6	90	NGS	Acetophenone	98-86-2	S16T021675
ΥЗ	n/a EY	1.8	n/a	n/a	n/a	n/a	590	<1.8	85	NGS	Acetonitrile	75-05-8	S16T021675
n/a BELY	n/a	4.3	n/a	n/a	n/a	n/a	850	4.6	78	NGS	Acetone	67-64-1	S16T021675
٧L	n/a JY	1.9	n/a	n/a	n/a	n/a	2.1	<1.9	87	NGS	4-Methyl-2-Pentanone	108-10-1	S16T021675
ΥU	n/a UY	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	88	NGS	4-Methyl-2-hexanone	105-42-0	S16T021675
VΥ	n/a UY	2.4	n/a	n/a	n/a	n/a	<2.4	<2.4	88	NGS	3-Octanone	106-68-3	S16T021675
4	n/a Y	1.5	n/a	n/a	n/a	n/a	49	<1.5	87	NGS	3-Heptanone	106-35-4	S16T021675
ΥĽ	n/a JY	1.7	n/a	n/a	n/a	n/a	6.6	<1.7	83	NGS	3-Buten-2-one	78-94-4	S16T021675
VΥ	n/a UY	1.9	n/a	n/a	n/a	n/a	<1.9	<1.9	86	NGS	2-Methylfuran	534-22-5	S16T021675
~	n/a Y	1.2	n/a	n/a	n/a	n/a	12	<1.2	84	NGS	2-Hexanone	591-78-6	S16T021675
Ϋ́	n/a JY	1.6	n/a	n/a	n/a	n/a	9.4	<1.6	84	NGS	2-Heptanone	110-43-0	S16T021675
~	n/a Y	1.9	n/a	n/a	n/a	n/a	98	<1.9	82	NGS	2-Butanone	78-93-3	S16T021675
VΥ	n/a UY	2.8	n/a	n/a	n/a	n/a	<2.8	<2.8	92	NGS	2,5-Dihydrofuran	1708-29-8	S16T021675
n/a UY		3.3	n/a	n/a	n/a	n/a	<3.3	<3.3	91	NGS	2,4-Dimethylpyridine	108-47-4	S16T021675
4	1	3.0	n/a	n/a	n/a	n/a	61	<3.0	79	NGS	1-Propanol	71-23-8	S16T021675
n/a LYa		5.6	n/a	n/a	n/a	n/a	<5.6	<5.6	65	NGS	1-Heptanol	111-70-6	S16T021675
7		8.9	n/a	n/a	n/a	n/a	220	<8.9	83	NGS	1-Butanol	71-36-3	S16T021675
n/a UY	n/a	1.7	n/a	n/a	n/a	n/a	<1.7	<1.7	91	NGS	1,4-Dioxane	123-91-1	S16T021675
n/a UY	n/a	2.0	n/a	e/u	n/a	n/a	<2.0	<2.0	92	NGS	1,4-Dichlorobenzene	106-46-7	S16T021675
n/a UY	n/a	1.2	n/a	n/a	n/a	n/a	<1.2	n/a	n/a	NGS	1,3-Dichloropropene (Total)	542-75-6	S16T021675
n/a UY	n/a	1.6	n/a	n/a	n/a	n/a	<1.6	<1.6	92	NGS	1,2-Dichloroethane	107-06-2	S16T021675
n/a UY	n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	78	NGS	1,1-Dichloroethene	75-35-4	S16T021675
n/a UY	n/a	1.2	n/a	n/a	n/a	n/a	<1.2	<1.2	87	NGS	1,1-Dichloroethane	75-34-3	S16T021675
n/a UY	n/a	1.5	n/a	n/a	n/a	n/a	<1.5	<1.5	93	NGS	1,1,2-Trichloroethane	79-00-5	S16T021675
n/a UY	n/a	1.3	n/a	n/a	n/a	n/a	<1.3	<1.3	92	NGS	1,1,2,2-Tetrachloroethane	79-34-5	S16T021675
												VOA #2	VAPOR-TDU VOA #2
Qual FI	Det Limit Cnt Err % Qual Flags	Det Limit	Average RPD % Spk Rec %	RPD %	Average	Result Duplicate	Result	Blank	STD %	Unit	Analyte	A# CAS#	Sample# R

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination
J - Estimated

Q - Qualitative E - Outside Calibration Range N - Named TIC

U - Less Than Detection Limit L - LLS Outside Range

Y - Comment

Sample Group: 20162144
SDG Number:
Customer Sample ID: 16-06173-2-H1
Customer Sample ID: 16-06173-2-H1

Sample# R	A #	CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average RPD % Spk R	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	lual Flag
VAPOR-TDU VOA #2	S	OA #2	4	1000			30							
S16T021675	T	100-47-0	Benzonitrile	NGS	91	<1,9	<1.9	n/a	n/a	n/a		1.9	N/a UY	Y
S16T021675		123-72-8	Butanal	NGS	94	<2.1	13	n/a	n/a	n/a		2.1	n/a Y	
S16T021675	T	109-74-0	Butanenitrile	NGS	86	<1.2	21	n/a	n/a	n/a		1.2	n/a Y	
S16T021675	T	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a		1.6	n/a UY	Y
S16T021675	┪	108-90-7	Chlorobenzene	NGS	93	<1.5	<1.5	n/a	n/a	n/a		1.5	n/a UY	Y
S16T021675	T	75-00-3	Chioroethane	NGS	81	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	Y
S16T021675	┪	67-66-3	Chloroform	NGS	93	<1.5	3.2	n/a	n/a	e/u		1.5	YL BIU	~
S16T021675		110-82-7	Cyclohexane	NGS	87	<1.8	<1.8	n/a	n/a	n/a		1.8	n/a UY	7
S16T021675		124-18-5	Decane	NGS	92	<2.8	2.9	n/a	n/a	n/a		2.8	n/a JY	×
S16T021675	\neg	64-17-5	Ethanol	NGS	. 79	<7.4	120	n/a	n/a	n/a	n/a	7.4	n/a Y	
S16T021675	7	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a		1.5	n/a UY	Y
S16T021675	7	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	Y
S16T021675	٦	110-00-9	Furan	NGS	777	<1.6	2.1	n/a	n/a	n/a		1.6	n/a JY	~
S16T021675	П	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a		1.7	n/a UY	Y
S16T021675	T	628-73-9	Hexanenitrile	NGS	90	<1.5	1.7	n/a	n/a	n/a		1.5	n/a JY	~
S16T021675		126-98-7	Methacrylonitrile	NGS	88	<1.6	6.8	n/a	n/a	n/a		1.6	Ar e/u	7
S16T021675		75-09-2	Methylene Chloride	NGS	84	6.7	6.0	n/a	n/a	n/a		2.7	n/a BJLY	NLY
S16T021675	T	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY	Y
S16T021675		98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a		2.6	n/a UY	Y
S16T021675	\neg	110-59-8	Pentanenitrile	NGS	89	<1.6	7.5	n/a	n/a	n/a	n/a	1.6	n/a JY	7
S16T021675		107-12-0	Propanenitrile	NGS	90	<1.4	31	n/a	n/a	n/a		1.4	n/a Y	,
S16T021675		110-86-1	Pyridine	NGS	110	<3.8	5.3	n/a	n/a	n/a	n/a	3.8	n/a JY	Y
S16T021675	П	100-42-5	Styrene	NGS	93	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a JY	4
S16T021675		127-18-4	Tetrachloroethene	NGS	93	<1.6	23	n/a	n/a	n/a		1.6	n/a Y	
S16T021675	\dashv	108-88-3	Toluene	NGS	91	<1.5	4.1	n/a	n/a	n/a		1.5	n/a JY	~
S16T021675		79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a		1.5	n/a UY	Y
S16T021675		75-69-4	Trichlorofluoromethane	NGS	81	<1.6	220	n/a	n/a	n/a		1.6	n/a Y	•
S16T021675	П	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a		1.3	n/a UY	Y
3731607313		123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	п/a		1.4	n/a UY	7

NA = Not Analyzed, ND = Not Detected a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit L - LLS Outside Range

Q - Qualitative E - Outside Calibration Range N - Named TIC

> B - Blank Contamination J - Estimated

> > C.133

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-H1 Customer Sample ID: 16-06173-2-H1

Sample#	æ	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flag
VAPOR-TDL	R-TDU	VOA #2											
S16T021675	5	142-82-5	n-Heptane	NGS	85	<1.4	10	n/a	n/a	n/a	n/a	1.4	n/a JY
S16T021675	5	10061-02-6	trans-1,3-Dichloropropene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY

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a - LCS Outside Range T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

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Sample Group: 20162144
SDG Number:
Customer Sample ID: 16-06173-2-H2
Customer Sample ID: 16-06173-2-H2

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU VOA #2	JU VOA #2												
S16T021676	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021676	79-00-5	1,1,2-Trichloroethane	NGS	93	4.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021676	75-34-3	1,1-Dichloroethane	NGS	87	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	`
S16T021676	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021676	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021676	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	
S16T021676	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a UY	
S16T021676	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021676	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a LUY	~
S16T021676	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a LUYa	Ya
S16T021676	71-23-8	1-Propanol	NGS	79	<3.0	3.8	n/a	n/a	n/a	n/a	3.0	n/a JY	
S16T021676	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a UY	*
S16T021676	1708-29-8	2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	1
S16T021676	78-93-3	2-Butanone	NGS	82	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021676	110-43-0	2-Heptanone	NGS	84	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	
S16T021676	591-78-6	2-Hexanone	NGS	84	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	1
S16T021676	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021676	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	2
S16T021676	106-35-4	3-Heptanone	NGS	87	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY	
S16T021676	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a UY	
\$16T021676	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021676	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	N/a UY	
S16T021676	67-64-1	Acetone	NGS	78	4.6	310	n/a	n/a	n/a	n/a	4.3	n/a BLY	~
S16T021676	75-05-8	Acetonitrile	NGS	85	<1.8	1.1E+03	n/a	n/a	n/a	n/a	1.8	n/a EY	
S16T021676	98-86-2	Acetophenone	NGS	90	<2.6	8.0	n/a	n/a	n/a	n/a	2.6	n/a JY	,
S16T021676	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021676	107-18-6	Allyl Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LUY	~
S16T021676	107-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	Na UY	
S16T021676	71-43-2	Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	

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Q - Qualitative E - Outside Calibration Range N - Named TIC

Y - Comment

U - Less Than Detection Limit L - LLS Outside Range

J - Estir

B - Blank Contamination J - Estimated

a - LCS Outside Range T - Tentatively Identified Compound

C.135

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-H2 Customer Sample ID: 16-06173-2-H2

Sample# R	A# CAC#	Analyte	lina		200	2						
TANDON TO	CAS#	rueijee	Onit	SID%	ыалк	Kesuit	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	JU VOA #2					100						
S16T021676	100-47-0	Benzonitrile	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY
S16T021676	123-72-8	Butanal	NGS	94	2.1	<2.1	n/a	n/a	n/a	n/a	2.1	
S16T021676	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	
S16T021676	56-23-5	Carbon tetrachloride	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T021676	108-90-7	Chlorobenzene	NGS	93	4.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	75-00-3	Chloroethane	NGS	83	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	
S16T021676	67-66-3	Chloroform	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	110-82-7	Cyclohexane	NGS	87	41.8	<1.8	n/a	n/a	n/a	n/a	1.80	
S16T021676	124-18-5	Decane	NGS	92	<2.8	3.0	n/a	n/a	n/a	n/a	2.8	
S16T021676	64-17-5	Ethanol	NGS	79	<7.4	150	n/a	n/a	n/a	n/a	7.4	Ì
S16T021676	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	110-00-9	Furan	NGS	777	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T021676	110-54-3	Hexane	NGS	80	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	
S16T021676	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	126-98-7	Methacrylonitrile	NGS	88	<1.6	3.5	n/a	n/a	n/a	n/a	1.6	
S16T021676	75-09-2	Methylene Chloride	NGS	84	6.7	4.2	n/a	n/a	n/a	n/a	2.7	
S16T021676	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	
S16T021676	98-95-3	Nitrobenzene	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	
S16T021676	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T021676	107-12-0	Propanenitrile	NGS	90	<1.4	14	n/a	n/a	n/a	n/a	1.4	
S16T021676	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	
S16T021676	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T021676	127-18-4	Tetrachloroethene	NGS	93	<1.6	18	n/a	n/a	n/a	n/a	1.6	
S16T021676	108-88-3	Toluene	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T021676	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	260	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T021676	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	
S16T021676	123-86-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	

Y - Comment U - Less Than Detection Limit L - LLS Outside Range

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Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-H2 Customer Sample ID: 16-06173-2-H2

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VAPOR-TDU VOA #2			THE PERSON NAMED IN								
S16T021676 142-82-5 n-F	n-Heptane	NGS	85	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a UY
S16T021676 10061-02-6 tra	rans-1,3-Dichloropropene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1 2	NIEIN

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U - Less Than Detection Limit L - LLS Outside Range

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B - Blank Contamination
J - Estimated

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-IN-BASE Customer Sample ID: 16-06173-2-IN-BASE

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average RPD % Spk Rec	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T021677	79-34-5	1,1,2,2-Tetrachloroethane	NGS	92	<1.3	<1.3	n/a	n/a	n/a	n/a	1:3	n/a UY	~
S16T021677	79-00-5	1,1,2-Trichloroethane	NGS	93	<1.5	<1.5	e/u	n/a	n/a	n/a	1.5	n/a UY	1
S16T021677	75-34-3	1,1-Dichloroethane	NGS	87	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	~
S16T021677	75-35-4	1,1-Dichloroethene	NGS	78	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	~
S16T021677	107-06-2	1,2-Dichloroethane	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY	~
S16T021677	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a UY	
S16T021677	106-46-7	1,4-Dichlorobenzene	NGS	92	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a UY	
S16T021677	123-91-1	1,4-Dioxane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021677	71-36-3	1-Butanol	NGS	83	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a LUY	7
S16T021677	111-70-6	1-Heptanol	NGS	65	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a LUYa	BYL
S16T021677	71-23-8	1-Propanol	NGS	79	<3.0	9.1	n/a	n/a	n/a	n/a	3.0	n/a JY	,
S16T021677	108-47-4	2,4-Dimethylpyridine	NGS	91	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U	
S16T021677	1708-29-8	8 2,5-Dihydrofuran	NGS	92	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	
S16T021677	78-93-3	2-Butanone	NGS	82	<1.9	2.7	n/a	n/a	n/a	n/a	1.9	n/a JY	ै
S16T021677	110-43-0	2-Heptanone	NGS	84	<1.6	6.2	n/a	n/a	n/a	n/a	1.6	n/a JY	
S16T021677	591-78-6	2-Hexanone	NGS	84	<1.2	2.3	n/a	n/a	n/a	n/a	1.2	n/a JY	
S16T021677	534-22-5	2-Methylfuran	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021677	78-94-4	3-Buten-2-one	NGS	83	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021677	106-35-4	3-Heptanone	NGS	87	<1.5	29	n/a	n/a	n/a	n/a	1.5	n/a Y	
S16T021677	106-68-3	3-Octanone	NGS	88	<2.4	<2.4	n/a	· n/a	n/a	n/a	2.4	n/a UY	
S16T021677	105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a UY	
S16T021677	108-10-1	4-Methyl-2-Pentanone	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a UY	
S16T021677	67-64-1	Acetone	NGS	78	4.6	41	n/a	n/a	n/a	n/a	4.3	n/a BLY	~
S16T021677	75-05-8	Acetonitrile	NGS	85	<1.8	150	n/a	n/a	n/a	n/a	1.8	n/a Y	
S16T021677	98-86-2	Acetophenone	NGS	90	<2.6	14	n/a	n/a	n/a	n/a	2.6	n/a Y	
S16T021677	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a UY	
S16T021677	107-18-6	Allyl Alcohol	NGS	75	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a LUY	₹
S16T021677	107-05-1	Allyl Chloride	NGS	81	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a UY	
S16T021677	71-43-2	Benzene	NGS	90	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	Na JY	

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tamination

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Cartridge Evaluation
Data Summary of All Results

SDG Number:
Customer Sample ID: 16-06173-2-IN-BASE
Customer Sample ID: 16-06173-2-IN-BASE

Sample Group: 20162144

VAPOR-TDU VOA #2	U VOA #2		O III,	210%	Digita	Neson	vesor publicate	Average RPD % Spk Rec %	KPU %	Spk Rec %	Det Limit Cnt Err % Qual Flags	Cnt Err %
VAPOR-11	100.47-0	Bonnonitoilo	200	2								П
S16T021677	123-72-8	Butanal	NGS S	0 4	2.5	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	n/a	n/a	n/a	n/a	1.9	n/a UY
S16T021677	109-74-0	Butanenitrile	NGS	86 94	42.1	2.1	n/a	n/a	n/a	n/a	2.1	n/a UY
S16T021677	56-23-5	Carbon tetrachloride	NGS	90 00	41.6	416	n/a	n/a	n/a	n/a	1.2	n/a UY
S16T021677	108-90-7	Chlorobenzene	NGS	93	41.5	45	n/a	n/o	n/a	n lo	1.0	TO BUT
S16T021677	75-00-3	Chloroethane	NGS	81 0	<1.9	41.9	n/a	n/a	n/a	n/a	0.5	YO BYD
S16T021677	67-66-3	Chloroform	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/o	2 2	200
S16T021677	110-82-7	Cyclohexane	NGS	87	<u>^1</u>	1.8	n/a	n/a	n/a	n/a	2 -	1/4 01
S16T021677	124-18-5	Decane	NGS	92	<2.8	5.1	n/a	n/a	n/a	n/a	3 0	7/2
S16T021677	64-17-5	Ethanol	NGS	79	<7.4	22	n/a	n/a	n/a	n/a	7.4	n/a JY
S16T021677	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	- i	ח/א עץ
S16T021677	100-41-4	Ethylbenzene	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021677	110-00-9	Furan	NGS	77	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021677	110-54-3	Hexane	NGS	80	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a JY
S16T021677	628-73-9	Hexanenitrile	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
\$161021677	126-98-7	Methacrylonitrile	NGS	88	<1.6	3.7	n/a	n/a	n/a	n/a	1.6	n/a JY
S16T021677	75-09-2	Methylene Chloride	NGS	84	6.7	5.3	n/a	n/a	n/a	n/a	2.7	n/a BJLY
S16T021677	91-20-3	Naphthalene	NGS	92	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a UY
S16T021677	98-95-3	Nitrobenzene	NGS	91	<2.6	3.8	n/a	n/a	n/a	n/a	2.6	n/a JY
S16T021677	110-59-8	Pentanenitrile	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
\$161021677	107-12-0	Propanenitrile	NGS	90	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a UY
S16T021677	110-86-1	Pyridine	NGS	110	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a UY
S16T021677	100-42-5	Styrene	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a UY
S16T021677	127-18-4	Tetrachloroethene	NGS	93	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T021677	108-88-3	Toluene	NGS	91	<1.5	5.3	n/a	n/a	n/a	B/u	1.5	n/a JY
S16T021677	79-01-6	Trichloroethene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a UY
S16T021677	75-69-4	Trichlorofluoromethane	NGS	81	<1.6	5.7	n/a	n/a	n/a	n/a	1.6	n/a JY
S16T021677	10061-01-5	cis-1,3-Dichloropropene	NGS	91	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	N/a UY
S16T031677	123-96-4	n-Butyl acetate	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	14	n/oliv

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-IN-BASE Customer Sample ID: 16-06173-2-IN-BASE

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VAPOR-10	JU VOA #2											
S16T021677	142-82-5	n-Heptane	NGS	85	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/aluy
TOTO CONT											1.7	170
7791701919	0-20-19001	trans-1,3-Dichloropropene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	12	n/a IIV

B - Blank Contamination J - Estimated

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NA = Not Analyzed, ND = Not Detected

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Data Summary of All Results Cartridge Evaluation

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-B1

Customer Sample ID: 16-06173-2-B1

Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	#2						
S16T021667			Methyl formate	107-31-3	4.81	NGS	46	46 JNTY
S16T021667			Acetic acid	64-19-7	10.13	NGS	14	14 JNTY
S16T021667			Formamide	75-12-7	14.28	NGS	110	YTNL 01
S16T021667			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	55	55 JNTY
S16T021667			Decane, 3,7-dimethyl-	17312-54-8	23.01	NGS	58	58 JNTY
S16T021667			2,6-Dimethyldecane	13150-81-7	23.14	NGS	25	25 JNTY
S16T021667			Undecane	1120-21-4	23.74	NGS	31	31 JNTY
S16T021667			Undecane, 4,7-dimethyl-	17301-32-5	23.85	NGS	58	58 JNTY
S16T021667			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	55	55 JNTY
S16T021667			Unknown-1		24.26	NGS	110	110 JTY
S16T021667			Dodecane	112-40-3	25.28	NGS	63	63 JNTY
S16T021667			1-Octanol, 3,7-dimethyl-	106-21-8	25.41	NGS	51	51 JNTY
S16T021667			Unknown-2		26.01	NGS	88	88 JTY
S16T021667			Methenamine	100-97-0	26.20	NGS	320	320 JNTY
S16T021667			Benzothiazole	95-16-9	26.32	NGS	130	130 JNTY
S16T021667			Dodecane,4,6-dimethyl	61141-72-8	26.45	NGS	38	38 JNTY
S16T021667			Dodecane, 2,6,11-Trimethyl	31295-56-4	26.57	NGS	7.0	7.0 JNTY
S16T021667			Tridecane	629-50-5	26.59	NGS	6.5	6.5 JNTY
S16T021667			Tetradecane	629-59-4	27.03	NGS	19	19 JUTY
S16T021667		BLNK	Unknown-1	10	8.27	NGS	50	
S16T021667		BLNK	Unknown-2	1	24.30	NGS	27	
S16T021667		BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021667		BLNK	1.1.1.3.5.5.7.7.Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment U - Less Than Detection Limit

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162144 SDG Number: 25-Aug-2016 9:0806 DSRTICHardcopy 2.7.32 DSR.Jar v. 3.0.12

Customer Sample ID: 16-06173-2-BLANK
Customer Sample ID: 16-06173-2-BLANK

Sample# R	24	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T021668			Cyclotetrasiloxane, octamethyl	556-67-2	20.49	NGS	40	40 JNTY
S16T021668			Decane, 2,4,6-trimethyl-	62108-27-4	23.01	NGS	21	21 JNTY
S16T021668			Undecane	1120-21-4	23.15	NGS	8.5	8.5 JNTY
S16T021668			Dodecane	112-40-3	23.85	NGS	16	16 JNTY
S16T021668			Undecanal	112-44-7	23.96	NGS	36	36 JNTY
S16T021668			Unknown-1		24.26	NGS	41 JTY	JTY
S16T021668			1,2-Benzisothiazole	272-16-2	26.34	NGS	60	ALING 09
S16T021668		BLNK	Unknown-1		8.26	NGS	51	

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Data Summary of All Results Cartridge Evaluation

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-C1
Customer Sample ID: 16-06173-2-C1

Sample# R A# VAPOR-TDU VOA #2 S16T021669 S16T021669 S16T021669 S16T021669 S16T021669 S16T021669 S16T021669	VOA #2	ас туре	Methyl formate Unknown-1 Formamide Propanoic acid, 2,2-dimethyl- Cyclotrisiloxane, hexamethyl- Cyclotetrasiloxane, octamethyl	CAS No. 107-31-3 75-12-7 75-98-9 541-05-9 556-67-2	(Minutes) 4.73 8.22 14.03 16.50 17.05 20.48		NGS NGS NGS NGS NGS
1669			Cyclotetrasiloxane, octamethyl 3-Ethyl-3-methylheptane	556-67-2 17302-01-1	20.48	01 48	
S16T021669	Н		2,6-Dimethyldecane	13150-81-7	23.14		
S16T021669			Hexanoic acid, 2-ethyl-	149-57-5	23.70	0	
S16T021669	+		Undecane	1120-21-4	23.74	74	
S16T021669 S16T021669			Undecane, 4,7-dimethyl- Decane, 2,4,6-trimethyl-	17301-32-5 62108-27-4	23 23	23.85	1.85 NGS
S16T021669	4		Unknown-2		2	24.26	
\$161021669			Dodecane	112-40-3	21	25.28	
S16T021669			1-Octanol, 3,7-dimethyl-	106-21-8	25	25.41	.41 NGS
S16T021669			2-Propenoic acid, octyl ester	2499-59-4	26.01	.01	.01 NGS
S16T021669	\perp		Methenamine	100-97-0	26.21	21	
S16T021669	4		Dodecane,4,6-dimethyl	61141-72-8	26.45	45	45 NGS
S16T021669			Dodecane, 2,6,11-trimethyl-	31295-56-4	26.58	58	
S16T021669			Tridecane	629-50-5	26	26.60	
S16T021669			Unknown-3		26	26.66	3.66 NGS
S16T021669	F		Tetradecane	629-59-4	27	27.04	.04 NGS
S16T021669	BLNK	×	Unknown-1		8.	8.27	27 NGS
\$16T021669 \$16T021669	BLNK	え え	Unknown-2 Mercaptoacetic acid, bis(trime	6398-62-5	2 2	24.30	1.30 NGS
S16T021669	BLNK	Ŕ	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	32	

NA = Not Analyzed, ND = Not Detected

Q - Qualitative E - Outside Calibration Range

Y - Comment
U - Less Than Detection Limit

B - Blank Contamination J - Estimated

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected a - LCS Outside Range
T - Tentatively Identified Compound

Data Summary of All Results Cartridge Evaluation

25-Aug-2016 9:0806 DSRTICHardcopy 2.7.32 DSR.Jar v. 3.0.12

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-C1

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Data Summary of All Results Cartridge Evaluation

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-D1 Customer Sample ID: 16-06173-2-D1

S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 \$161021670 S16T021670 \$16T021670 \$16T021670 S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 16T021670 16T021670 VAPOR-TDU VOA #2 QC Type 2-Propenoic acid, octyl ester Dodecane Analyte Methenamine 2,3-Dimethyldecane Benzothiazole Decane, 2,4,6-trimethyl-2,6-Dimethyldecane 1-Octanol, 3,7-dimethyl-Jnknown-2 Undecane, 4,7-dimethyl-Jndecane Hexanoic acid, 2-ethyl-3-Ethyl-3-methylheptane Cyclotetrasiloxane, octamethyl Cyclotrisiloxane, hexamethyl-Propane, 2-methyl-1-nitro--ormamide Jnknown-1 Methyl formate 95-16-9 100-97-0 2499-59-4 62108-27-4 17302-01-1 556-67-2 541-05-9 75-12-7 CAS No. 106-21-8 112-40-3 17312-44-6 17301-32-5 149-57-5 13150-81-7 625-74-1 107-31-3 120-21-4 Retention Time (Minutes) 26.34 25.28 26.22 26.02 25.41 23.95 23.74 23.14 20.48 24.26 24.06 23.85 23.70 23.01 17.05 16,49 14.04 8.22 4.73 NGS Unit Result 120 JNTY 47 JNTY 210 JNTY 130 JNTY 250 BJTY 120 JNTY 27 JNTY 82 JNTY 64 JNTY YING 001 140 JNTY 38 JNTY 27 JNTY 3 25 JNTY 25 28 JNTY 42 JNTY 47 JNTY YIN 5 BJTY Qual Flags

NA = Not Analyzed, ND = Not Detected

Q - Qualitative E - Outside Calibration Range

Y - Comment U - Less Than Detection Limit

S16T021670 S16T021670 S16T021670 S16T021670 S16T021670 S16T021670

BLNK BLNK BLNK

Mercaptoacetic acid, bis(trime

6398-62-5

S16T021670 S16T021670

Dodecane, 4,6-dimethyl

Dodecane, 2,6,11-trimethyl-

61141-72-8

31295-56-4

26.58 26.46

NGS

120 JNTY

45 JNTY

Unknown-3

1,2,3,4,5-Cyclopentanepentol

56772-25-9

629-59-4

27.04 26.83 26.66

NGS

NGS NGS NGS

25 YINL 89

Ę

61 JNTY

8.27

NGS NGS

27 50

30

Unknown-1

Tetradecane

Jnknown-2

B - Blank Contamination
J - Estimated

T - Tentatively Identified Compound a - LCS Outside Range Y - Comment U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected a - LCS Outside Range
T - Tentatively Identified Compound

Cartridge Evaluation

25-Aug-2016 9:0806 DSRTICHardcopy 2.7.32 DSR.Jar v. 3.0.12

Sample Group: 20162144

SDG Number:

Data Summary of All Results

Customer Sample ID: 16-06173-2-D1 Customer Sample ID: 16-06173-2-D1 QC Type CAS No. Retention Time (Minutes) Result Qual Flags

S16T021670

BLNK

1,1,1,3,5,5,7,7,7-Nonamethyl-3

38146-99-5

25.32

NGS

52

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Cartridge Evaluation
Data Summary of All Results

Customer Sample ID: 16-06173-2-E1
Customer Sample ID: 16-06173-2-E1

Sample Group: 20162144 SDG Number:

Sample# R	A# Q	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flanc
VAPOR-TDU VOA #2							Timeson.	Choi i ion
S16T021671			Acetic acid	64-19-7	11.50	NGS	7.8	YTNL 87
S16T021671			Formamide	75-12-7	14.71	NGS	200	200 JNTY
S16T021671			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	69	YTNL 69
S16T021671			2,6-Dimethyldecane	13150-81-7	23.01	NGS	55	55 JNTY
S16T021671			Undecane	1120-21-4	23.74	NGS	21	21 JNTY
S16T021671			Undecane, 5,7-dimethyl-	17312-83-3	23.85	NGS	53	53 JNTY
S16T021671			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	32	32 JNTY
S16T021671		_	Unknown-1		24.26	NGS	150 JTY	T
S16T021671			Dodecane	112-40-3	25.28	NGS	58	58 JNTY
S16T021671			Methenamine	100-97-0	26.19	NGS	29	29 JNTY
S16T021671		_	Benzothiazole	95-16-9	26.30	NGS	130	130 JNTY
S16T021671			Dodecane,4,6-dimethyl	61141-72-8	26.43	NGS	45	45 JNTY
S16T021671			2-Hexyl-1-octanol	19780-79-1	26.58	NGS	32	32 JNTY
S16T021671			1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.63	NGS	31	31 JNTY
S16T021671		1	Tetradecane	629-59-4	27.01	NGS	23	23 JNTY
S16T021671	BLNK		Unknown-1	1	8.27	NGS	50	
S16T021671	BLNK		Unknown-2	1	24.30	NGS	27	
S16T021671	BLNK	-	Mercaptoacetic acid, bis(trime	6398-62-5	25,10	NGS	30	
S16T021671	BLNK		1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-EFF-BASE
Customer Sample ID: 16-06173-2-EFF-BASE

Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	J VOA #2						1110000	4
S16T021672			Methyl formate	107-31-3	4.72	NGS	18	18 JUTY
S16T021672			Unknown-1		8.22	NGS	28	28 BJTY
S16T021672			Cyclotrisiloxane, hexamethyl-	541-05-9	17.05	NGS	28	28 JNTY
S16T021672			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	150	YINL 05
S16T021672			3-Ethyl-3-methylheptane	17302-01-1	23.01	NGS	78	YTNL 87
S16T021672			2,6-Dimethyldecane	13150-81-7	23.14	NGS	33	33 JNTY
S16T021672			Undecane	1120-21-4	23.74	NGS	19	YIN 61
S16T021672		à-	Undecane, 5,7-dimethyl-	17312-83-3	23.85	NGS	54	54 JULY
S16T021672			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	50	50 JNTY
S16T021672			Unknown-2		24.26	NGS	180 JTY	기
S16T021672			Dodecane	112-40-3	25.28	NGS	47	47 JNTY
S16T021672			2-Propenoic acid, octyl ester	2499-59-4	25.41	NGS	29	29 JNTY
S16T021672			Unknown-3		26.02	NGS	31	31 JTY
\$167021672			Methenamine	100-97-0	26.21	NGS	79	79 JNTY
S16T021672			Benzothiazole	95-16-9	26.34	NGS	97	97 JNTY
S16T021672			Dodecane,4,6-dimethyl	61141-72-8	26.46	NGS	40	40 JNTY
S16T021672			Tetradecane	629-59-4	27.04	NGS	22	22 JNTY
S16T021672	BLNK	XX	Unknown-1	Т	8.27	NGS	50	
S16T021672	BLNK	X	Unknown-2	1	24.30	NGS	27	
S16T021672	BLNK	NK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021672	BLNK	K	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

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Less	Comi
Than	nent
Detection	
Limit	

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected

SDG Number:

Sample Group: 20162144

Customer Sample ID: 16-06173-2-F1
Customer Sample ID: 16-06173-2-F1

Sample# R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flace
VAPOR-TDU VOA #2	VOA #						Thought.	dual line
S16T021673			Methyl formate	107-31-3	4.84	NGS	38	38 JNTY
S16T021673			Ethylene Glycol	107-21-1	14.36	NGS	29	29 JNTY
S16T021673			Formamide	75-12-7	14.55	NGS	510	510 JUTY
S16T021673			Decane, 3,7-dimethyl-	17312-54-8	23.00	NGS	25	OT NTY
S16T021673			Undecane	1120-21-4	22.74	NOG	2 2	
\$16T031672	1		2	1 1 1 1 1 1	20.14	WGG	24	Z4 JNIT
0101021010	İ		2,0-Dimenyloecane	7-18-06151	23.85	NGS	30	30 JNTY
\$161021673	L		Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	24	24 JNTY
S16T021673			Unknown-1		24.26	NGS	68	68 BJTY
S16T021673			Dodecane	112-40-3	25.28	NGS	47	47 JNTY
S16T021673			Methenamine	100-97-0	26.22	NGS	320 JNTY	YTN
S16T021673			Benzothiazole	95-16-9	26.33	NGS	71	71 JNTY
S16T021673			Dodecane,4,6-dimethyl	61141-72-8	26.46	NGS	16	16 JNTY
S16T021673			Tetradecane	629-59-4	27.04	NGS	9.7	9.7 JNTY
\$161021673		BLNK	Unknown-1	1	8.27	NGS	50	
S16T021673	m	BLNK	Unknown-2	T	24.30	NGS	27	
S16T021673	_	BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25,10	NGS	30	
S16T021673	_	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-G1
Customer Sample ID: 16-06173-2-G1

Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
S16T021674	- VOA #	2	Methyl formate	107-31-3	4.82	NGS	73	73 INTV
S16T021674			Ethylene Glycol	107-21-1	14.32	NGS	15	15 JUTY
S16T021674			Formamide	75-12-7	14.46	NGS	86	86 JUTY
S16T021674			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	100	100 JNTY
S16T021674		7	3-Ethyl-3-methylheptane	17302-01-1	23.01	NGS	100	YTNL 001
S16T021674			2,6-Dimethyldecane	13150-81-7	23.14	NGS	42	42 JNTY
S16T021674			Undecane	1120-21-4	23.74	NGS	21	21 JNTY
S16T021674			Undecane, 4,7-dimethyl-	17301-32-5	23.85	NGS	70	70 JNTY
S16T021674			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	45	45 JNTY
S16T021674			Unknown-1		24.26	NGS	130	130 BJTY
S16T021674			Undecane, 3-methyl-	1002-43-3	24.90	NGS	8.0	8.0 JNTY
S16T021674			Dodecane	112-40-3	25.28	NGS	39	39 JNTY
S16T021674			Methenamine	100-97-0	26.22	NGS	47	47 JNTY
\$161021674	L		Benzothiazole	95-16-9	26.34	NGS	27	27 JNTY
S16T021674			Dodecane,4,6-dimethyl	61141-72-8	26.47	NGS	27	27 JNTY
S16T021674			Tetradecane	629-59-4	27.04	NGS	15	15 JNTY
S16T021674		BLNK	Unknown-1	1	8.27	NGS	50	
S16T021674		BLNK	Unknown-2	1	24.30	NGS	27	
S16T021674		BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021674		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination
J - Estimated

a - LCS Outside Range
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-H1
Customer Sample ID: 16-06173-2-H1

Sample# R	Ş.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2 \$16T021675	OA #2	100	Methyl formate	107-31-3	4.71	NGS	37	37 INTY
S16T021675			4-Methoxy-1-pentene	98386-09-5	7.15	NGS	28	28 JNTY
S16T021675			Unknown-1		8.32	NGS	60	60 BJTY
S16T021675			Tetrahydrofuran	109-99-9	11.96	NGS	5.8	5.8 JNTY
S16T021675			Ethylene Glycol	107-21-1	14.62	NGS	160	160 JNTY
S16T021675			Formamide	75-12-7	14.74	NGS	82	82 JNTY
S16T021675			Neopentane	463-82-1	15.75	NGS	33	33 JNTY
S16T021675			Acetonitrile, hydroxy-	107-16-4	16.31	NGS	31	31 JNTY
S16T021675			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	130	130 JNTY
S16T021675			2,6-Dimethyldecane	13150-81-7	23.01	NGS	51	51 JNTY
S16T021675			Undecane	1120-21-4	23.74	NGS	22	22 JNTY
S16T021675	L		Undecane, 5,7-dimethyl-	17312-83-3	23.85	NGS	35	35 JNTY
S16T021675			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	36	36 JNTY
S16T021675			Unknown-2		24.26	NGS	120	120 BJTY
S16T021675			Dodecane	112-40-3	25.28	NGS	42	42 JNTY
S16T021675			2-Propenoic acid, octyl ester	2499-59-4	26.01	NGS	29	29 JNTY
S16T021675			Benzothiazole	95-16-9	26.33	NGS	73	73 JNTY
S16T021675	L		Dodecane,4,6-dimethyl	61141-72-8	26,45	NGS	15	15 JNTY
S16T021675	L		Tridecane	629-50-5	26.60	NGS	13	13 JNTY
S16T021675	L		Tetradecane	629-59-4	27.04	NGS	6.5	6.5 JNTY
S16T021675	В	BLNK	Unknown-1	1	8.27	NGS	50	
S16T021675	В	BLNK	Unknown-2	J	24.30	NGS	27	
S16T021675	В	BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021675	В	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-H2
Customer Sample ID: 16-06173-2-H2

Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	1 1						1
S16T021676			Methyl formate	107-31-3	4.72	NGS	53	53 JNTY
S16T021676			Unknown-2		8.32	NGS	74	74 BJTY
S16T021676			Formamide	75-12-7	14.32	NGS	110	YTNL 011
S16T021676			Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	82	82 JNTY
S16T021676			3-Ethyl-3-methylheptane	17302-01-1	23.00	NGS	48	48 JNTY
S16T021676			Undecane	1120-21-4	23.74	NGS	21	21 JNTY
S16T021676			Decane, 3,7-dimethyl-	17312-54-8	23.85	NGS	38	38 JNTY
S16T021676			Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	27	27 JNTY
S16T021676			Unknown-1		24.26	NGS	110	10 JTY
S16T021676			Dodecane	112-40-3	25.28	NGS	39	39 JNTY
S16T021676			2-Propenoic acid, octyl ester	2499-59-4	26.01	NGS	39	39 JNTY
S16T021676			Methenamine	100-97-0	26.20	NGS	260	260 JNTY
S16T021676			Benzothiazole	95-16-9	26.32	NGS	75	75 JNTY
S16T021676			Dodecane,4,6-dimethyl	61141-72-8	26.45	NGS	22	22 JNTY
S16T021676			Dodecane, 2,6,11-trimethyl-	31295-56-4	26.60	NGS	24	24 JNTY
S16T021676			Tetradecane	629-59-4	27.03	NGS	11	11 JUTY
S16T021676		BLNK	Unknown-1	1	8.27	NGS	50	
S16T021676		BLNK	Unknown-2	Ţ	24.30	NGS	27	
S16T021676		BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021676		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment
U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

a - LCS Outside Range
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162144 SDG Number:

Customer Sample ID: 16-06173-2-IN-BASE
Customer Sample ID: 16-06173-2-IN-BASE

Sample# R	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flace
VAPOR-TDU VOA #2	- 1	- 1				100001	choi i ions
S16T021677		Unknown-1		8.22	NGS	51	51 JTY
S16T021677		Acetic acid	64-19-7	9.48	NGS	20	20 JNTY
S16T021677		Ethylene Glycol	107-21-1	14.10	NGS	1.1E+03 JNTY	YTN
S16T021677		Cyclotrisiloxane, hexamethyl-	541-05-9	17.05	NGS	31	31 JNTY
S16T021677		Cyclotetrasiloxane, octamethyl	556-67-2	20.48	NGS	210	210 JNTY
S16T021677		3-Ethyl-3-methylheptane	17302-01-1	23.01	NGS	98	98 JNTY
S16T021677		2,6-Dimethyldecane	13150-81-7	23.14	NGS	39	39 JNTY
S16T021677		Hexanoic acid, 2-ethyl-	149-57-5	23.70	NGS	55	55 JNTY
S16T021677		Undecane	1120-21-4	23.74	NGS	21	21 JNTY
S16T021677		Undecane, 4,7-dimethyl-	17301-32-5	23.85	NGS	74	74 JNTY
S16T021677		Decane, 2,4,6-trimethyl-	62108-27-4	23.95	NGS	70	70 JNTY
S16T021677		Unknown-2		24.26	NGS	290	290 JTY
S16T021677		Dodecane	112-40-3	25.28	NGS	44	44 JNTY
S16T021677		1-Octanol, 3,7-dimethyl-	106-21-8	25.41	NGS	43	43 JNTY
S16T021677		2-Propenoic acid, octyl ester	2499-59-4	26.01	NGS	50	50 JNTY
S16T021677		Methenamine	100-97-0	26.20	NGS	150	150 JNTY
S16T021677		Benzothiazole	95-16-9	26.32	NGS	150	150 JNTY
S16T021677		Dodecane,4,6-dimethyl	61141-72-8	26,45	NGS	50	50 JNTY
S16T021677		Silane, tetramethyl-	75-76-3	26.65	NGS	38	38 JNTY
S16T021677		Tetradecane	629-59-4	27.03	NGS	25	25 JNTY
S16T021677	BLNK	Unknown-1	1	8.27	NGS	50	
S16T021677	BLNK	Unknown-2	1	24.30	NGS	27	
S16T021677	BLNK	Mercaptoacetic acid, bis(trime	6398-62-5	25.10	NGS	30	
S16T021677	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.32	NGS	52	

Y - Comment
U - Less Than Detection Limit

Q - Qualitative E - Outside Calibration Range

B - Blank Contamination J - Estimated

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-A1
Customer Sample ID: 16-06172-3-A1

Sample# R	A #	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average RPD % S	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in Vi	apor S	Furans in Vapor Samples by SIN	×										
S16T021587		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	0.48	n/a	n/a	n/a	n/a	0.18	n/a J
S16T021587		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021587		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
\$16T021587		3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.44	n/a	n/a	n/a	n/a	0.27	n/a J
S16T021587		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021587		3777-69-3	2-Pentylfuran	NGS	89	<0.34	0.44	n/a	n/a	n/a	n/a	0.34	n/a J
316T021587		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
\$16T021587		6-00-011	Furan	NGS	73	<0.090	0.30	n/a	n/a	n/a	n/a	0.090	n/a J
\$16T021587		109-99-9	Tetrahydrofuran	NGS	91	<0.10	12	n/a	n/a	n/a	n/a	0.10	n/a

NA = Not Analyzed, ND = Not Detected

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-A2
Customer Sample ID: 16-06172-3-A2

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flag
Furans in V	apor S	Furans in Vapor Samples by SIM	M										
16T021588		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
16T021588		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021588		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
16T021588		3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.34	n/a	n/a	n/a	n/a	0.27	n/a J
16T021588		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021588		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
16T021588		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
16T021588		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
16T021588	4	6-66-601	Tetrahydrofuran	NGS	91	<0.10	<0.10	n/a	n/a	n/a	n/a	0.10	n/a U

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-B1
Customer Sample ID: 16-06172-3-B1

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			•											
Sample# R	A#		CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in	Vapo	or Sa	Furans in Vapor Samples by SIM	M										
S16T021589	\dashv	===	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021589	_	-1	1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a ∪
S16T021589	-	62	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021589	-	37	3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.36	n/a	n/a	n/a	n/a	0.27	r 8/u
S16T021589	-	5	534-22-5	2-Methylfuran	NGS	83	<0.23	< 0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021589	-	3	3777-69-3	2-Pentylfuran	NGS	89	<0.34	0.39	n/a	n/a	n/a	n/a	0.34	r/a J
S16T021589	-	4	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021589	Н	-1	10-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021589	Н	10	09-99-9	Tetrahydrofuran	NGS	91	<0.10	<0.10	n/a	n/a	n/a	n/a	0.10	n/a U

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Cartridge Evaluation Data Summary of All Results

SDG Number: Customer Sample ID: 16-06172-3-BLANK Customer Sample ID: 16-06172-3-BLANK

Sample Group: 20162139

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average RPD % Spk Re	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flag
Furans in V	/apor	Furans in Vapor Samples by SIM	M										
\$16T021590		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	a n/a	0.18	n/a U
\$16T021590		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	a n/a	0.23	n/a U
\$16T021590		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	< 0.43	n/a	n/a	n/a	a n/a	0.43	n/a U
\$16T021590		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	a n/a	0.27	n/a U
\$16T021590		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	a n/a	0.23	n/a U
\$16T021590		3777-69-3	2-Pentylfuran	NGS	89	< 0.34	<0.34	n/a	n/a	n/a	a n/a	0.34	n/a U
\$16T021590	-	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	a n/a	0.44	n/a U
316T021590		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	a n/a	0.090	n/a U
\$16T021590		109-99-9	Tetrahydrofuran	NGS	91	<0.10	<0.10	n/a	n/a	n/a	a n/a	0.10	n/a U

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Cartridge Evaluation Data Summary of All Results

SDG Number: Customer Sample ID: 16-06172-3-C1 Customer Sample ID: 16-06172-3-C1

Sample Group: 20162139

Sample# R	A#	# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
Furans in	Vapo	urans in Vapor Samples by SIM	MI											
S16T021591	\dashv	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a	J
S16T021591	\dashv	1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a l	_
S16T021591	4	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	< 0.43	n/a	n/a	n/a	n/a	0.43	n/a	C
S16T021591	4	3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.29	n/a	n/a	n/a	n/a	0.27	n/a	_
S16T021591	4	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	
S16T021591	4	3777-69-3	2-Pentylfuran	NGS	89	<0.34	< 0.34	n/a	n/a	n/a	n/a	0.34	n/a	_
S16T021591	4	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a l	2
S16T021591	4	110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a	-
S16T021591		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.12	n/a	n/a	e/u	n/a	0.10	n/a	_

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-D1
Customer Sample ID: 16-06172-3-D1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	apor	Furans in Vapor Samples by SIM	M										
S16T021592		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021592		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021592		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	
S16T021592		3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.35	n/a	n/a	n/a	n/a	0.27	
S16T021592		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021592		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021592		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021592		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021592	ij	109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.31	n/a	n/a	n/a	n/a	0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-E1
Customer Sample ID: 16-06172-3-E1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flag:
Furans in V	apor	Furans in Vapor Samples by SIM	X										
S16T021593	T	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021593		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	0.26	n/a	n/a	n/a	n/a	0.23	n/a J
S16T021593		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021593		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021593		534-22-5	2-Methylfuran	NGS	83	<0.23	0.27	n/a	n/a	n/a	n/a	0.23	n/a J
S16T021593		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021593	Н	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021593	Т	110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021593		109-99-9	Tetrahydrofuran	NGS	91	<0.10	1.0	n/a	n/a	n/a	n/a	0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-EFF-BAS
Customer Sample ID: 16-06172-3-EFF-BAS

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Cnt Err % Qual F
Furans in V	apor	Furans in Vapor Samples by SIM	M										
S16T021594	П	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021594		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021594		625-86-5	2,5-Dimethylfuran	NGS	85	< 0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021594		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021594	-	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021594		3777-69-3	2-Pentylfuran	NGS	89	< 0.34	<0.34	n/a	n/a	n/a	B/u	0.34	n/a U
S16T021594		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021594		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021594		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.16	n/a	n/a	n/a	n/a	0.10	n/a J

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-F1
Customer Sample ID: 16-06172-3-F1

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in \	/apor	Furans in Vapor Samples by SIM	M						700				
S16T021595		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021595		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
S16T021595		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021595		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021595		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021595		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021595		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021595		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021595	Ĭ	109-99-9	Tetrahydrofuran	NGS	91	<0.10	2.4	n/a	n/a	n/a	n/a	0.10	n/a J

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-G1
Customer Sample ID: 16-06172-3-G1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in V	apor	Furans in Vapor Samples by SIM	MIS	40.00						1		6.0	400
S16T021596	Ħ	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021596		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021596		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021596	-	3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021596		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021596	_	3777-69-3	2-Pentylfuran	NGS	89	<0.34	< 0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021596	-	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021596		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021596		109-99-9	Tetrahydrofuran	NGS	01	<0.10	0	nio	2/2	2/2	2/2	0.10	

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162139
SDG Number:
Customer Sample ID: 16-06172-3-H1
Customer Sample ID: 16-06172-3-H1

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in V	apor	Furans in Vapor Samples by SIM	IM								30		950
S16T021597	\neg	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021597		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021597	7	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	< 0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021597		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
\$161021597		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021597	П	3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021597	П	4229-91-8	2-Propylfuran	NGS	87	<0.44	0.58	n/a	n/a	n/a	n/a	0.44	r e/u
S16T021597	_	110-00-9	Furan	NGS	73	<0.090	0.38	n/a	n/a	n/a	n/a	0.090	n/a J
S16T021597	П	109-99-9	Tetrahydrofuran	NGS	91	<0.10	18	n/a	n/a	n/a	n/a	0.10	n/a

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162139

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SDG Number: Customer Sample ID: 16-06172-3-H2 Customer Sample ID: 16-06172-3-H2

Sample# R	A# C	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	apor Sa	Furans in Vapor Samples by SIM	M							Ì			
16T021598	=	191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
16T021598	17	708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021598	62	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
16T021598	37	3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
16T021598	53	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021598	37	3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
16T021598	42	1229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
16T021598	11	10-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
16T021598	10	09-99-9	Tetrahydrofuran	NGS	91	<0.10	3.5	n/a	n/a	n/a	n/a	0.10	n/a

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162139 SDG Number: Customer Sample ID: 16-06172-3-IN-BASE Customer Sample ID: 16-06172-3-IN-BASE

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flag
Furans in \	/apor	Furans in Vapor Samples by SIM	MIS										Constitution of the consti
\$16T021599		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
316T021599		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
S16T021599		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	п/a		0.43	n/a U
S16T021599		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a		0.27	n/a U
16T021599		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021599		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a		0.34	n/a U
S16T021599		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a		0.44	n/a U
16T021599		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
16T021599		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.15	n/a	n/a	n/a	n/a	0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-A1
Customer Sample ID: 16-06173-3-A1

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flag
Furans in V	apor :	Furans in Vapor Samples by SIM	M										
S16T021603		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/alu
S16T021603		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
\$16T021603		625-86-5	2.5-Dimethylfuran	NGS	85	<0.43	٥0 43	n/a	ala	2		2 1	2/2
COLONGO	1	4 74 4440	200		+	-					Ī	0.10	-
5161021603		3///-/1-/	2-Heptylfuran	NGS	92	<0.27	0.35	n/a	n/a	n/a	n/a	0.27	r/a J
S16T021603	Г	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021603		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a		0.34	n/a U
S16T021603		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a		0.44	n/alu
S16T021603		110-00-9	Furan	NGS	73	<0.090	0.37	n/a	n/a	n/a		0.090	n/a J
S16T021603		109-99-9	Tetrahydrofuran	NGS	91	<0,10	9.3	n/a	n/a	n/a	n/a	0.10	n/a

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162140 SDG Number: 24 - Aug - 2016 7:53:41 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

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					l
	Customer Sample ID: 16-06173-3-A2	mer Sample	usto	_	
	2. 10.00110.001	of campion			
	Customer Sample ID: 16-06173-3-49	er Sample IF	stom	0	
			ODO Hamber	000	

Sample# R	4	# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk R	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in	Vapo	Furans in Vapor Samples by	MIS										
S16T021607	Н	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a II
TOTOLOGY	+	4700 00 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0									0.10	100
\$161021607		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
16T021607	_	625-86-5	2,5-Dimethylfuran	NGS	85	< 0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
\$16T021607	_	3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.28	n/a	n/a	n/a	n/a	0.27	n/a J
16T021607	-	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a
16T021607	H	3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
16T021607	H	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
16T021607	-	110-00-9	Furan	NGS	73	<0.090	0.10	n/a	n/a	n/a	n/a	0.090	n/a J
16T021607	H	109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.12	n/a	n/a	n/a	n/a	0.10	n/a J

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-B1
Customer Sample ID: 16-06173-3-B1

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in Va	urans in Vapor Samples by SIM	by SIM										
S16T021608	1191-99-7	3-7 2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/alu
S16T021608	1708-29-8	3-8 2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0 22	n/all
S16T021608	625-86-5	5 2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0 43	0/211
S16T021608	3777-71-7	-7 2-Heptylfuran	NGS	92	<0.27	0.37	n/a	n/a	n/a	n/a	0.27	n/a I
S16T021608	534-22-5		NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0 23	n/all
S16T021608	3777-69-3	3-3 2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/all
S16T021608	4229-91-8	-8 2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0 44	110/0
S16T021608	110-00-9	9 Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021608	109-99-9	9 Tetrahydrofuran	NGS	91	<0.10	0.23	n/a	n/a	n/a	n/a	0 10	n/a l

Cartridge Evaluation
Data Summary of All Results

Data Sum

Sample Group: 20162140 SDG Number: 24 - Aug - 2016 7:53:41 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	Average RPD % Snk R	Rec %	Det Limit C	Det Limit Cot Err % Ougl Elace
Furans in V	apor	Furans in Vapor Samples by SIM	Mis						,		Γ		Sur ray of great Light
STATOSTAGO	1	1101 00 7	3 3 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7										
6001201010	t	1-66-1611	2,3-Dinydroturan	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021609		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	2/3	0 00	26
S16T021609		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0 43	p la la
S16T021609	î i	3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/o	2/2	2	200	1100
SISTOMAGO		2 55 752	O Mark If		-	-			100	100	170	12.0	III'al C
8001201010	t	C-77-4CC	z-metnyituran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
\$161021609		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	0/2
S16T021609		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/o	260	2/2	-		
CIGTOSIGNO	1	2000	1				1	2000	11/0	ing	IV d	0.44	n/a U
8467024609	†	10-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
20101010		6-66-601	Tetrahydroturan	NGS	91	<0.10	<0.10	n/a	n/a	n/a	n/a	0 10	n/a II

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140

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SDG Number: Customer Sample ID: 16-06173-3-C1 Customer Sample ID: 16-06173-3-C1

	l												
Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	por S	Furans in Vapor Samples by SIM	IM										
S16T021610		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	B/n	0.18	n/a U
S16T021610		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021610		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	a n/a	0.43	n/a U
S16T021610		3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.47	n/a	n/a	n/a	B/n	0.27	n/a J
S16T021610		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	B/n	0.23	n/a U
S16T021610		3777-69-3	2-Pentylfuran	NGS	89	<0.34	0.35	n/a	n/a	n/a	B/n	0.34	n/a J
S16T021610		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021610		110-00-9	Furan	NGS	73	<0.090	0.090	n/a	n/a	n/a	n/a	0.090	n/a J
S16T021610		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.24	n/a	n/a	n/a	B/n	0.10	n/a l

NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation
Data Summary of All Results

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Customer Sample ID: 16-06173-3-D1 Customer Sample ID: 16-06173-3-D1

Sample Group: 20162140 SDG Number:

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	apor	Furans in Vapor Samples by SIM	M										
S16T021611		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/alu
S16T021611		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	0.39	n/a	n/a	n/a		0.23	0/2
S16T021611	-	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a		0 43	n/a 1
S16T021611		3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.44	n/a	n/a	n/a		0.27	n/a J
S16T021611		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
S16T021611		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a		0.34	n/alu
S16T021611		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021611		110-00-9	Furan	NGS	73	<0.090	0.10	n/a	n/a	n/a		0.090	n/a J
S16T021611		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.24	n/a	n/a	n/a		0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-E1
Customer Sample ID: 16-06173-3-E1

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Re	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in V	apor S	Furans in Vapor Samples by SIM	M										
316T021612		191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	0.27	n/a	n/a	n/a	n/a	0.18	n/a J
16T021612	1	1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
16T021612	0	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a		0.43	n/a U
16T021612	a	3777-71-7	2-Heptylfuran	NGS	92	<0.27	0.29	n/a	n/a	n/a		0.27	n/a J
16T021612	(h	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a		0.23	n/a U
16T021612	ü	3777-69-3	2-Pentylfuran	NGS	89	<0.34	0.57	n/a	n/a	n/a		0.34	n/a J
16T021612	4	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a		0.44	n/a U
16T021612		10-00-9	Furan	NGS	73	<0.090	0.11	n/a	n/a	n/a		0.090	n/a J
16T021612		09-99-9	Tetrahydrofuran	NGS	91	<0.10	0.75	n/a	n/a	n/a		0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-EFF-BASE
Customer Sample ID: 16-06173-3-EFF-BASE

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flag
Furans in V	apor \$	Furans in Vapor Samples by SIM	IM										
S16T021613		7-66-1611	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/alii
16T021613		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	0/0	T	0 22	2/2/11
16TOTICETS		2 20 303	200							100	1000	0.20	11/0
2101701913		6-98-629	2,5-Dimethylturan	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021613		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021613		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021613		3777-69-3	2-Pentylfuran	NGS	89	<0.34	0.39	n/a	n/a	n/a	ļ	0.34	n/a.l
16T021613		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a		0.44	n/alu
S16T021613		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a		0.090	n/a U
16T021613		109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.14	n/a	n/a	n/a	n/a	0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-F1
Customer Sample ID: 16-06173-3-F1

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Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flans
Furans in '	Vapo	Furans in Vapor Samples by SIM	M								- 10	500000000000000000000000000000000000000	
S16T021614		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a		0 18	n/alti
CARTONARA	1	4700 00 0	200							200	1110	0.10	inalo
5161021614	\vdash	1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	п/a	n/a	0.23	n/a U
S16T021614	Н	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a		0.43	n/oll
SISTOMERA		Ē	3 Lond III									0.10	-
310/10/10/4	H	3///-/1-/	2-Heptylluran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
\$161021614	H	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021614		3777-69-3	2-Pentylfuran	NGS	89	<0.34	×0.34	n/a	n/o	2/2		20	
CACATORICA	1	2000										0.07	inac
3101021014	H	4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021614		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/o
S16T021614		109-99-9	Tetrahydrofuran	NGS	91	<0.10	1.3	n/a	n/a	n/a	n/a	0 10	n/o - 0

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-G1
Customer Sample ID: 16-06173-3-G1

24 - Aug - 2016 7:53:41 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample# R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	/apor	Furans in Vapor Samples by SIM	M									100000000000000000000000000000000000000	
S16T021615	-	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0 18	n/all1
\$16T021615		1708-29-8	2.5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	olo	2	T	0 0	
	1								2001	2000	100	0.20	I I I I
\$161021615	H	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	< 0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021615	-	3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
\$16T021615		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/alU
S16T021615		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a		0.34	n/a U
\$16T021615		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a		0.44	n/a U
S16T021615		110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a		0.000	n/all
S16T021615		109-99-9	Tetrahydrofuran	NGS	91	<0.10	1.7	n/a	n/a	n/a		0.10	n/a J

Cartridge Evaluation
Data Summary of All Results

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24 - Aug - 2016 7:53:41 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

SDG Number: Customer Sample ID: 16-06173-3-H1 Customer Sample ID: 16-06173-3-H1

Sample Group: 20162140

Sample# R	2#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flag
Furans in Va	apor	Furans in Vapor Samples by SIM	MIS										
S16T021616		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	0.22	n/a	n/a	n/a	n/a	0.18	n/a J
S16T021616		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021616		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021616		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021616	П	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021616		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021616		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a U
S16T021616		110-00-9	Furan	NGS	73	<0.090	0.51	n/a	n/a	n/a	n/a	0.090	n/a J
S16T021616		109-99-9	Tetrahydrofuran	NGS	91	<0.10	13	n/a	n/a	n/a	n/a	0.10	n/a

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

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Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-H2
Customer Sample ID: 16-06173-3-H2

	l													
Sample# R	2#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flag	Qual Flags
Furans in V	apor	Furans in Vapor Samples by SIM	M											
\$16T021617		1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a	2
16T021617		1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	-
16T021617		625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a	2
16T021617		3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a	2
16T021617		534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	2
16T021617		3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a	٢
16T021617		4229-91-8	2-Propylfuran	NGS	87	<0.44	<0.44	n/a	n/a	n/a	n/a	0.44	n/a	2
16T021617	10. T	110-00-9	Furan	NGS	73	<0.090	0.14	n/a	n/a	n/a	n/a	0.090	n/a	-
16T021617		109-99-9	Tetrahydrofuran	NGS	91	<0.10	2.3	n/a	n/a	n/a	e/u	0.10	n/a	-

Cartridge Evaluation
Data Summary of All Results

24 - Aug - 2016 7:53:41 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

Sample Group: 20162140
SDG Number:
Customer Sample ID: 16-06173-3-IN-BASE
Customer Sample ID: 16-06173-3-IN-BASE

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	Furans in Vapor Samples by SIM	SIM										
S16T021618	1191-99-7	2,3-Dihydrofuran	NGS	80	<0.18	<0.18	n/a	n/a	n/a	n/a	0.18	n/a U
S16T021618	1708-29-8	2,5-Dihydrofuran	NGS	90	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021618	625-86-5	2,5-Dimethylfuran	NGS	85	<0.43	<0.43	n/a	n/a	n/a	n/a	0.43	n/a U
S16T021618	3777-71-7	2-Heptylfuran	NGS	92	<0.27	<0.27	n/a	n/a	n/a	n/a	0.27	n/a U
S16T021618	534-22-5	2-Methylfuran	NGS	83	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T021618	3777-69-3	2-Pentylfuran	NGS	89	<0.34	<0.34	n/a	n/a	n/a	n/a	0.34	n/a U
S16T021618	4229-91-8	2-Propylfuran	NGS	87	<0.44	0.50	n/a	n/a	n/a	n/a	0.44	r/a J
S16T021618	110-00-9	Furan	NGS	73	<0.090	<0.090	n/a	n/a	n/a	n/a	0.090	n/a U
S16T021618	109-99-9	Tetrahydrofuran	NGS	91	<0.10	0.24	n/a	n/a	n/a	n/a	0.10	n/a J

C.3.4 Amines



ANALYTICAL REPORT

Report Date: August 02, 2016

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

20162152

Workorder: 34-1620981

Client Project ID: Washington River Protection

IHREP-V12.3

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Robert (Buddy) Sosa

Richland, WA 99352

Washington River Protection So PO Box 850, MSIN T6-02

Sample ID: S16T022010 Collected: 07/22/2016 Received: 07/27/2016 Lab ID: 1620981001 Media: SKC 226-96, XAD-7 Tube Method: Amines-VOA Aliphatic VAA-1 Analyzed: 08/01/2016 50/100mg [(NBD) Chloride] Sampling Parameter: Air Volume Not Provided Result (ug/sample) Analyte Result (ppm) RL (ug/sample) Result (mg/m³) Dimethylamine NA NA 0.10 0.13 Ethylamine <0.10 NA NA 0.10 Methylamine <0.10 NA NA 0.10

Sample ID: \$16T022011 Lab ID: 1620981002				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Aliphatic			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T02201 2 Lab ID: 1620981003				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10

Results Continued on Next Page

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Workorder: 34-1620981

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T022012 Collected: 07/22/2016 Lab ID: 1620981003 Received: 07/27/2016 Method: Amines-VOA Aliphatic VAA-1 Media: SKC 226-96, XAD-7 Tube Analyzed: 08/01/2016 50/100mg [(NBD) Chloride] Sampling Parameter: Air Volume Not Provided Result (ug/sample) RL (ug/sample) Analyte Result (mg/m²) Result (ppm) Methylamine <0.10 NA 0.10

Sample ID: \$16T022013 Collected: 07/22/2016 Lab ID: 1620981004 Received: 07/27/2016 Method: Amines-VOA Aliphatic VAA-1 Media: SKC 226-96, XAD-7 Tube Analyzed: 08/01/2016 50/100mg [(NBD) Chloride] Sampling Parameter: Air Volume Not Provided Result RL (ug/sample) Analyte (ug/sample) Result (mg/m²) Result (ppm) Dimethylamine <0.10 NA NA 0.10 Ethylamine < 0.10 NA NA 0.10 <0.10 NA NA 0.10 Methylamine

Sample ID: \$16T022014 Collected: 07/22/2016 Received: 07/27/2016 Lab ID: 1620981005 Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride] Method: Amines-VOA Aliphatic VAA-1 Analyzed: 08/01/2016 Sampling Parameter: Air Volume Not Provided Result Analyte (ug/sample) Result (mg/m³) Result (ppm) RL (ug/sample) Dim ethylam ine < 0.10 NA NA 0.10 Ethylamine < 0.10 NA NA 0.10 Methylamine < 0.10 NA NA 0.10

Sample ID: S16T022015 Collected: 07/22/2016 Lab ID: 1620981006 Received: 07/27/2016 Method: Amines-VOA Aliphatic VAA-1 Media: SKC 226-96, XAD-7 Tube Analyzed: 08/01/2016 50/100mg [(NBD) Chloride] Sampling Parameter: Air Volume Not Provided Result Result (ppm) Analyte (ug/sample) RL (ug/sample) Result (mg/m²) 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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Workorder: 34-1620981

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Researcs				
Sample ID: S16T022016				Collected: 07/22/2016
Lab ID: 1620981007				Received: 07/27/2016
Method: Amines-VOA Alipha			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02201 Lab ID: 1620981008				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor /olume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02201 Lab ID: 162098100				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Ali	•		226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T022019 Lab ID: 1620981010				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1620981

Client Project ID: Washington River Protection So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results				
Sample ID: S16T022020				Collected: 07/22/2016
Lab ID: 1620981011				Received: 07/27/2016
Method: Amines-VOA Aliph			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	0.10	NA	NA	0.10
Methylamine	0.36	NA	NA	0.10

Sample ID: \$16T022021 Lab ID: 1620981012				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Aliphatic VA			226-96, XAD-7 Tul 00mg [(NBD) Chlor /olume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02202 Lab ID: 1620981013				Collected: 07/22/2016 Received: 07/27/2016
Method: Amines-VOA Alij			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02202 3 Lab ID: 1620981014				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1620981

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Andrytical Results				
Sample ID: S16T022024				Collected: 07/23/2016
Lab ID: 1620981015				Received: 07/27/2016
Method: Amines-VOA Aliphati			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02202 Lab ID: 162098101				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Aliphatic VAA-1 Media: SKC 226-96, XA 50/100mg [(NBD Sampling Parameter: Air Volume Not				ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02202 Lab ID: 1620981017				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02202 Lab ID: 1620981018				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1620981

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results				
Sample ID: S16T022028	į.			Collected: 07/23/2016
Lab ID: 1620981019				Received: 07/27/2016
Method: Amines-VOA Alipl			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T02202 Lab ID: 1620981020				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Aliphatic VAA-1 Media Sampling Paramete			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02203 Lab ID: 162098102				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Alij			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02203 Lab ID: 162098102				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Ali			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1620981

Client Project ID: Washington River Protection So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Andrytical Results				
Sample ID: S16T022032				Collected: 07/23/2016
Lab ID: 1620981023				Received: 07/27/2016
Method: Amines-VOA Aliphati			C 226-96, XAD-7 Tu 100mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02203 Lab ID: 162098102				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Ali	•		226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T02203 Lab ID: 162098102				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Ali	•		226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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: \$16T022035 Lab ID: 1620981026				Collected: 07/23/2016 Received: 07/27/2016
Method: Amines-VOA Alip			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m³)	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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Workorder: 34-1620981

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	
A	/S/ David Teynor	/S/ Thomas Bosch	
Amines-VOA Aliphatic VAA-1	08/02/2016 15:18	08/02/2016 16:09	

Laboratory Contact Information

ALS Environmental Phone: (801) 266-7700
960 W Levoy Drive Email: alslt.lab@ALSGlobal.com
Salt Lake City, Utah 84123 Web: www.alsslc.com

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	ACLASS (DoD ELAP)	ADE-1420	http://www.aclasscorp.com
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	1A# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/qa/
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
Industrial Hygiene	AIHA-LAP, LLC (ISO 17025 and AIHA-LAP, LLC IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	http://www.aclasscorp.com
Soil, Dust, Paint ,Air	AIHA-LAP, LLC (ISO 17025, AIHA-LAP, LLC ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.com



Workorder: 34-1620981

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

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 Envrionmental 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: 1620981

Limits: Historical/Performance Preparation: NA
Basis: ALS Laboratory Group Batch: NA

Prepared By: NA Analyzed By: David Teynor

Analysis: IH Aliphatic Amines Batch: ILC/12401 (HBN: 173887)

Blank.

LMB: 510814

Analyzed: 08/01/2016 00:00

Units: ug/sample

Result MDL RL Analyte NA 0.100 Dimethylamine ND ND NA 0.100 Ethylamine Methylamine ND NA 0.100

LMB: 510817

Analyzed: 08/01/2016 00:00

Units: ug/sample

Analyte Result MDL RL Dimethylamine ND NA 0.100 Ethylamine ND NA 0.100 Methylamine ND 0.100 NA

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 510815 LCSD: 510816 Analyzed: 08/01/2016 00:00 Analyzed: 08/01/2016 00:00

Dilution: 1

Dilution: 1

Units: ug/sample Units: ug/sample QC Limits Analyte Result %Rec Result % Rec RPD QC Limits Target Dimethylamine 1.38 2.00 69.0 60.4 134.6 1.47 73.5 6.32 20.0 0.0 1.63 2.00 81.5 160.0 1.42 13.8 20.0 Ethylamine 40.0 71.0 0.0 Methylamine 1.60 2.00 80.0 40.0 160.0 1.63 81.5 1.86 0.0 20.0

LCS: 510818

Analyzed: 08/01/2016 00:00

Dilution: 1

LCSD: 510819

Analyzed: 08/01/2016 00:00

Dilution: 1

Units: ug/sample

Units: ug/sample		119				Units: ug	y sample	155		
Analyte	Result	Target	% Rec	QCL	imits	Result	%Rec	RPD	QC LI	mits
Dimethylamine	1.51	2.00	75.5	60.4	134.6	1.47	73.5	2.68	0.0	20.0
Ethylamine	1.76	2.00	88.0	40.0	160.0	1.58	79.0	10.8	0.0	20.0
Methylamine	1.61	2.00	80.5	40.0	160.0	1,66	83.0	3.06	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ David Teynor	/S/ Thomas Bosch
08/02/2016 15:18	08/02/2016 16:09

Symbols and Definitions

Analyte above reporting limit or outside of control limits

RPD - Relative % Difference (Spike / Spike Duplicate)

▲ - Sample result is greater than 4 times the spike added

ND - Not Detected (U - Qualifier also flags analyte as not detected)

Sample and Matrix Duplicate less than 5 times the reporting limit
 Result is above the calibration range

NA - Not Applicable

QC results are not adjusted for moisture correction, where applicable

Page 1 of 1

Tuesday, August 02, 2016

QCS V4.1

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST Contractive was a con		1820381								
Contraction			1	i		5	IAIN OF CUSTODY/SAM	MPLE ANALYSIS REQUEST	2016215 Page 1 of	2 3
Sample Address Sample Organ Sa	Collector					Contact/Reque	estor VI	Telephone No ₃₇₃ -6861	MSIN FAX 372-1	878
Figure Compact Compa	SAF No.		1			Sample Origin	ALUATION	Purchase OrdenCharge Co		
Parts and Return No.	Project Title	HATTON				Logbook/ Work	k Package No.	Ice Chest No. WTS-	3 Temp. O.U.	377
Substitution Continuation Cont	Shipped To (La	(Q				Method of Ship	oment	Bill of Lading/Air Bill No.	1	2296
Liab Do Do Time No.Trype Container Sample Analysis S	Protocol					Data Tumarou	pui	Parts and Return No.	1	
11/2016 11/2	Sample No.	Lab ID	·	Date	Time	No./Type Contain	. Ja	Sample Analysis	a.	Preservative
10 10 10 10 10 10 10 10		S16T022010	Z.	_		XAD-7-NBD	AMINES 16-06172-4-A1		1/11	A
S167022012		S16T022011	VA	7/22/16		XAD-7-NBD	AMINES 16-06172-4-A2		1/N	ď
SIGNO22013		S16T022012	VA			XAD-7-NBD	AMINES 16-06172-4-B1		N/N	4
Sign		S16T022013	Z,	7/22/16		XAD-7-NBD	AMINES 16-06172-4-BLANK	ŧ	1/N	V.
Signozo15 VA 7/22/16 XAD-7-NBD ANINES 16-06172-4-E1 -		S16T022014	VA	7/22/16		XAD-7-NBD	AMINES 16-06172-4-C1 /		I/N	æ
Sign		S16T022015	N.	7/22/16		XAD-7-NBD	AMINES 16-06172-4-D1		1/18	d
Signozoli		S16T022016	N.			XAD-7-NBD	AMINES 16-06172-4-E1 -		1/N	æ
Sign		S16T022017	Z,			XAD-7-NBD	AMINES 16-06172-4-EFF-BA	. 388	/K	· A
Sign Print Sign Print Sign Print Sign Print Sign Print Print Sign Print Pr		\$167022018	VA	7/22/16		XAD-7-NBD	AMINES 16-06172-4-F1 *	1.670	1/8	4
MALIE HAZARDS/REMARKS (List all known wastes) MSDS O Yes		S16T022019	Z.	7/22/16		XAD-7-NBD	AMINES 16-06172-4-61		7/N	A
Print Sign Date/Time Received By Print Sign Date/Time Matrix SW Harder C 26-16 0900 S = Soil DL WRPS St. +6 7-26-16 / 400 S = Soil DL Date/Time Received By FEDEX Date/Time SE = Sectionent T SE = Sectionent	POSSIBLE SA	MPLE HAZARDSI	REMA	RKS (List al	Known was		% ⊙	RUCTIONS L C.A.L Howald IV & Greg Moore 148rl.gov and Gregory_S_Moore@rl. for email	Ною Тіте	
SW Harden WRPS SLAL 7-26-16 1400 Date/Time Received By Received B	Refinquished B	Holler 12	1	Sign	1.25.	Date/Time	Harder -	191-92-2 - July 1051	Matrix*	= Drum Liquids
Disposal Metrod (e.g., Return to customer, per lab procedure, Lased in process) Disposal Metrod (e.g., Return to customer, per lab procedure, Lased in process) Disposal Metrod (e.g., Return to customer, per lab procedure, Lased in process) Disposal Metrod (e.g., Return to customer, per lab procedure, Lased in process) ON O	Relinquished E	WRPS	1	14	7-26	J 1400		-	= Sediment T = Solid WI	= Tissue = Wipe = Linuid
Date/Time Color Procedure, Desired in process Disposed By Color Co	Relinquished E	No.		* Ad	8	ater	to South	the Jassell	water VA	= Vegetation = Vapor
Disposal Method (e.g., Return to customer, per lab procedure, lased in process) Disposed By ONS MM FT	Relinquished E			2		\ .	Received By	Date/Time / C	11	Omer
	FINAL SAMPLE DISPOSITION	Disposal N	(e.g.,	Return to cu	istomer, per	riab procedure, used		CHINED	08/01/16	D.'Oc

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$\frac{\text{MSIN}_{\text{TG-02}} \text{ FAX }_{37}}{\text{Code}}$ $\frac{O/3}{7668} \frac{\text{Temp. O }_{\text{U}}}{\text{V} \text{C} \text{Z} \text{S}}$ $\frac{4/O71}{4/O71}$ $\text{SE = Soli }_{\text{NM}}$ Natrix' $\text{SE = Soli }_{\text{NM}}$ NATRIX' $\text{SC = Solid }_{\text{U}}$ NATRIX'	Collector					CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		Page 2 of	of 3
Sign Case	2000					Contact/Request.	tor		SIN FAX 37	2-1878
Lighoody Work Package No. Lightoody Work	SAF No.					Sample Origin CARTRIDGE EVAL	MATTON	Purchase Order/Charge Code 202003/CB20		57
Date Windows Date Windows Date Windows Work	Project Title	TUBLION				Logbook Work F	Package No.	Ice Chest No. WTS - 013	Temp. O.V.	705
Date Time No.Type Container Sample Analysis Sample Analysis Sample Analysis Sample Analysis Sample Analysis	Shipped To (L:	ab)				Method of Shipm	nent	Bill of Lading/Air Bill No. 7768	7.51	5296
*** Date Time No.Type Container Sample Analysis 1 v.n. 7/22/15 xxb-7-n80 AMINES 16-06172-4-HI 2 v.n. 7/22/16 xxb-7-n80 AMINES 16-06172-4-HI 3 v.n. 7/22/16 xxb-7-n80 AMINES 16-06173-4-AI 4 v.n. 7/23/16 xxb-7-n80 AMINES 16-06173-4-AI 5 v.n. 7/23/16 xxb-7-n8D AMINES 16-06173-4-AI 6 v.n. 7/23/16 xxb-7-n8D AMINES 16-06173-4-DI 7 xxb-7-n8D AMINES 16-06173-4-DI 8 v.n. 7/23/16 xxb-7-n8D 9 v.n. 7/23/16 xxb-7-n8D 9 v.n. 7/23/16 xxb-7-n8D 10 AMINES 16-06173-4-DI 10 Sept-Coul NSTRUCTIONS 11 V.n. 7/23/16 xxb-7-n8D 12 Xxb-7-n8D AMINES 16-06173-4-DI 13 V.n. 7/23/16 xxb-7-n8D 14 V.n. 7/23/16 xxb-7-n8D 15 Xxb-7-n8D AMINES 16-06173-4-DI 15 V.n. 7/23/16	Protocol /A					Data Turnaround	p	Parts and Return No.	3	20
1	Sample No.	LabID	•	Date	Time	No./Type Container		mple Analysis		Preservative
1		S16T022020	VA	_		XAD-7-NBD	AMINES 16-06172-4-H1			N/A
17,721/16 XAD-7-NED ANTINES 16-06173-4-A1		S16T022021	V.	7/22/16		XAD-7-NBD	AMINES 16-06172-4-H2 *			N/A
YA 7/23/16 XAD-7-NBD ANINES 16-06173-4-21		S16T022022	Z			XAD-7-NBD	AMINES 16-06172-4-IN-BASE .			N/A
VA 7/23/16 XAD-7-NBD AMINES 16-06173-4-B1		S16T022023	8	7/23/16		XAD-7-NBD	AMINES 16-06173-4-A1			N/A
VA 7/23/16 XAD-7-NBD AMINES 16-06173-4-BLANK		\$167022024	K	7/23/16		XAD-7-NBD	AMINES 16-06173-4-A2			N/A
6 VA 7/23/16 XAD-7-NBD AMINES 16-06173-4-01. 8 VA 7/23/16 XAD-7-NBD AMINES 16-06173-4-01. 9 SECRETARY CONTRACT SECRETARY OF CART Howald IV & Greg Moore CART Hold Time SECRETARY SOW FOR Lemail CONTRACT SECRETARY SOW FOR LEMAIN SOM FEBERS 9 DESIGNED TO T-26-16 0900 S = Solil DI SIGNED TO T-26-16 0900 S = Sol		\$167022025	Z,			XAD-7-NBD	AMINES 16-06173-4-81 ·		No. of Person	N/A
VA 7/23/16 XAD-7-NBD ANTNES 16-06173-4-D1		\$167022026	K	7/23/16		XAD-7-NBD	AMINES 16-06173-4-BLANK	100000000000000000000000000000000000000		N/A
STREMARKS (List all known wastes) ANTHES 16-06173-4-D1 STREMARKS (List all known waste		S16T022027	Z,	7/23/16		XAD-7-NBD	AMINES 16-06173-4-C1			N/A
9 VA 7/23/16 XAD-7-NBD AMINES 16-06173-4-E1 DSPREMARKS (List all known wastes) MSDS O Yes		\$167022028	V.	7/23/16		XAD-7-NBD	AMINES 16-06173-4-D1 ·		0.00	N/A
Sign Beautist Carl Hovald IV & Greg Moore Carl World Carl World Carl World Carl Carl Carl Carl Carl Carl Carl Carl		\$167022029	V.	7/23/16		XAD-7-NBD	AMINES 16-06173-4-E1			N/A
Sign Date/Time Received By Print Sign 7-26-16 / 6900 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. 7-26-16 / 1400 S = Solf DI. S. A. L. M.	OSSIBLES	AMPLE HAZARDS/F	REMA	RKS (List all	Known was	des) MSDS 🔾 Ye			Yold Time	
Scattle 7-24-16/14 ox DaterTime Received By FEDEX Scattle 7-24-16/14 ox DaterTime Received By DaterTime Received By Disposed	Relinquished A	12 de Print	7	Sign	77		Harder Sux	o b	Matrix*	= Drum Liquids
Date/Time Received By Disposed	Relinquished	By SW Harder	00	7/1	7-27	vate/Time //yos		# S &	- <u>5</u> _	= Vissue = Wipe = Liquid
Disposal Method (e.g., Return to customer, per lab procedure, lesed in processs) Disposed By OSOVI6	Relinquished	By By		fee	ass)	01)	possection,	Descrime A William DaterTime Of A	> \$ ×	= Vegetation = Vapor = Other
	FINAL SAMPLE DISPOSITION	Disposal	(e.g.,	Return to cus	stomer, per				OSOV16	07:00

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					770	CHAIN OF CLISTONY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	203	20162152
					5	יוו סן כספן סט ויפאווון בב אויאו		Page	3 of 3
Collector					Contact/Requestor	or		MSIN FAX	FAX 372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	ATION	Purchase Order/Charge Code 202003/c820		
Project Title	MULTION			177	Logbook/ Work Package No.	ackage No.	loe Chest No. WTS - 0/3	Temp.	ON ICE
Shipped To (Lab)	ab)				Method of Shipment	ent	Bill of Lading/Air Bill No. 7768		4438 5296
Protocol N/A					Data Turnaround		Parts and Return No. 4/1	(101/7	
Sample No.	Lab ID	•	Date	Time	No./Type Container	Sampl	Sample Analysis	0.00	Preservative
	S16T022030	X,	7/23/16		XAD-7-NBD	AMINES 16-06173-4-EFF-BASE		1	N/A
	S16T022031	٧٨	7/23/16		XAD-7-NBD	AMINES 16-06173-4-F1			N/A
	S16T022032	V.	7/23/16		XAD-7-NBD	AMINES 16-06173-4-G1			N/A
	S16T022033	V.	7/23/16		XAD-7-NBD	AMINES 16-06173-4-H1			N/A
	S16T022034	VA	1/23/16		XAD-7-NBD	AMINES 16-06173-4-H2 ·		0.00	N/A
	S16T022035	N/A	VA 7/23/16		XAD-7-NBD	AMINES 16-06173-4-IN-BASE			N/A
		+	0.0						-
		+					2		
		-					9		
POSSIBLE S	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS	REMA	ARKS (List all	known was	ites) MSDS O Yes	s O No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl M. Rowald&11.gov and Gregory_S_Noore@fil gov See Sow for eaail, CONTRACT 55502		Hold Time	
Relinquished By	Ŧ,	1	Sign	3.31	Date/Time Re	Scort Hamber Quil	Date/Time Date/Time S = =	5	Irix* DL = Drum Liquids
Relinquished	Relinquished By: W Harder	3 03	74	7-26-16	Date/Time	N FEDEX		SE = Sediment T SO = Solid V SL = Sludge L	
Relinquished By Relinquished By	à à		4	9	Date/Time	Thur any DSLD James To Received By	Curle 1880 B-3776 W	Solids	V = Vegetation VA = Vapor X = Other
FINAL SAMPLE DISPOSITION	_	(e.g.,	Return to cu	stomer, per	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By		OSCOL	OS/OVIG 10.(P)
All samples c	ontaining hazardous	mate	rials shall be	picked up b	ny requestor and return	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.			A-6003-962 (03/05)

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C.3.5 Acetonitrile



ANALYTICAL REPORT

Report Date: July 29, 2016

Robert (Buddy) Sosa Washington River Protection So PO Box 850, MSIN T6-02 Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

20162151

Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T021945					d: 07/22/2016
Lab ID: 1620932001				Receive	d: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid		d: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	< 0.010	NA	NA	0.010	

Sample ID: \$16T021946 Lab ID: 1620932002				Collected: 07/22/20 Received: 07/27/20
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
	Result				
Method: NIOSH 1606	San		226-09, Charcoal 1 200mg Volume Not Provid		yzed: 07/28/2016
Sample ID: \$16T021947 Lab ID: 1620932003					cted: 07/22/2016 eived: 07/27/2016

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

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RIGHT SOLUTIONS RIGHT PARTNER

Page 1 of 8 Fri, 07/29/16 11:48 AM

IHREP-V12.3



Workorder: 34-1620932

Client Project ID: Washington River Protection So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T021948				Collected:	07/22/2016
Lab ID: 1620932004				Received:	07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid		07/28/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021949 Lab ID: 1620932005				Collected: 07/22/	
Method: NIOSH 1606	Sam		226-09, Charcoal 200mg	Tube Analyzed: 07/28/2	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA NA	NA NA	0.010	

Sample ID: \$16T021950 Lab ID: 1620932006				12000	cted: 07/22/2016 ived: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg	Tube Anal	yzed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021951				Collected: 07/22/20
Lab ID: 1620932007				Received: 07/27/20
Method: NIOSH 1606	San	Tube Analyzed: 07/28/201		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T021952				Collec	ted: 07/22/2016
Lab ID: 1620932008				Recei	ved: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid		zed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Lab ID: 1620932009				Recei	ved: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid	Market District	zed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	< 0.010	NA	NA	0.010	

Sample ID: \$16T021954 Lab ID: 1620932010				120m2	oted: 07/22/2016 ved: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid	and the same	zed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: S16T021955 Lab ID: 1620932011				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg	Tube Analyzed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T021956				Co	ollected: 07/22/2016
Lab ID: 1620932012				Re	eceived: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid		nalyzed: 07/28/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	ile)
Acetonitrile	<0.010	NA	NA	0.0	10

Sample ID: \$16T021957 Lab ID: 1620932013				Collected: 0 Received: 0	
Method: NIOSH 1606	San	Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided			07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021958 Lab ID: 1620932014				12.57	cted: 07/23/2016 ived: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid		yzed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021959 Lab ID: 1620932015					d: 07/23/2016 d: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid		d: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	



Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T021960				Collec	ted: 07/23/2016
Lab ID: 1620932016				Recei	ved: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid		zed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: S16T021961					07/23/2016
Lab ID: 1620932017				Received:	07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid	Markette Database # 1950 Process	07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	< 0.010	NA	NA	0.010	

Sample ID: \$16T021962 Lab ID: 1620932018				100 mm	oted: 07/23/2016 ved: 07/27/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided			Analyzed: 07/29/2016	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021963				Col	lected: 07/23/2016
Lab ID: 1620932019				Red	ceived: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid		alyzed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	e)
Acetonitrile	<0.010	NA	NA	0.01	10



Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
			led	
		Charles School Control of the Contro	Tube Analyze	ed: 07/29/2016
				ed: 07/27/2016
	Result	400. Sampling Parameter: Air ' Result (mg/sample) Result (mg/m²)	400/200mg Sampling Parameter: Air Volume Not Provid Result (mg/sample) Result (mg/m²) Result (ppm)	Media: SKC 226-09, Charcoal Tube Analyze 400/200mg Sampling Parameter: <mark>Air Volume Not Provided</mark> Result (mg/sample) Result (mg/m²) Result (ppm) RL (mg/sample)

Sample ID: \$16T021965 Lab ID: 1620932021				Collected: 07/23/201 Received: 07/27/201
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: \$16T021966 Lab ID: 1620932022				1200	cted: 07/23/2016 ived: 07/27/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided		ATTENDED TO THE PARTY OF THE PA	Analyzed: 07/29/2016	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Sample ID: \$16T021967				Collected:	07/23/2016
Lab ID: 1620932023				Received:	07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid	\$7.7.	07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	



Workorder: 34-1620932

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021968				(Collected: 07/23/2016
Lab ID: 1620932024				F	Received: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg /olume Not Provid		Analyzed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/san	nple)
Acetonitrile	< 0.010	NA	NA	0	0.010

Sample ID: \$16T021969 Lab ID: 1620932025				100mm (100mm)	ted: 07/23/2016 red: 07/27/2016
				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided				zed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	< 0.010	NA	NA	0.010	

Sample ID: \$16T021970 Lab ID: 1620932026				Wante	oted: 07/23/2016 ved: 07/27/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid	Tube Analy	zed: 07/29/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ Young Hee Yoon	/S/ Steven J. Sagers	
07/29/2016 10:52	07/29/2016 11:29	
	/S/ Young Hee Yoon	/S/ Young Hee Yoon /S/ Steven J. Sagers

Laboratory Contact Information

Phone: (801) 266-7700 Email: alslt.lab@ALSGlobal.com ALS Environmental 960 W Levoy Drive Salt Lake City, Utah 84123 Web: www.alsslc.com



Workorder: 34-1620932

Client Project ID: Washington River Protection

Purchase Order: 55502 Rel9 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	ACLASS (DoD ELAP) Utah (NELAC) Nevada Oklahoma Iowa Florida (TNI) Texas (TNI)	ADE-1420 DATA1 UT00009 UT00009 IA# 376 E871067 T 104704456-11-1	http://www.aclasscorp.com http://health.utah.gov/lab/labimp/ http://ndep.nv.gov/bsdw/labservice.htm http://www.deq.state.ok.us/CSDnew/ http://www.iowadnr.gov/lnsideDNR/RegulatoryWater.asp http://www.dep.state.fl.us/labs/bars/sas/qa/ http://www.tceq.texas.gov/field/qa/lab_accred_certif.htm	
Industrial Hygiene	AIHA-LAP, LLC (ISO 17025 and AIHA-LAP, LLC IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org	
Lead Testing: CPSC Soil, Dust, Paint ,Air	ACLASS (ISO 17025, CPSC) AIHA-LAP, LLC (ISO 17025, AIHA-LAP, LLC ELLAP and NLLAP)	ADE-1420 101574	http://www.aclasscorp.com http://www.aihaaccreditedlabs.org	
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.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 Envrionmental 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

Page 8 of 8 Fri, 07/29/16 11:49 AM IHREP-V123



Quality Control Sample Batch Report

Analysis Information

Workorder: 1620932

Limits: Historical/Performance Preparation: NA Analysis: IH GC-FID QC Batch: IFID/7630 (HBN: 173706) Basis: ALS Laboratory Group Batch: NA Prepared By: NA Analyzed By: Young Hee Yoon

Blank.

MB: 510328 Analyzed: 07/28/2016 00:00

Units: mg/sample

Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

MB: 510331

Analyzed: 07/28/2016 00:00

Units: mg/sample

Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 510329 Analyzed: 07/28/2016 00:00 Dilution: 1 Units: mg/sample						LCSD: 51 Analyzed: 07 Dilution: 1 Units: m	7/28/2016 0	0:00		
Analyte	Result	Target	%Rec	QCL	imits	Result	% Rec	RPD	QC Li	mits
Acetonitrile	0.307	0.312	98.4	86.6	115.3	0.316	101	2.89	0.0	20.0

LCS: 510332 LCSD: 510333 Analyzed: 07/28/2016 00:00 Analyzed: 07/28/2016 00:00

Dilution: 1 Units: mg/sample

Units: mg/sample Result % Rec QC Limits Result %Rec RPD QC Limits Analyte Target 20.0 Acetonitrile 0.264 0.250 106 86.6 115.3 0.248 99.4 6.25 0.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ Young Hee Yoon	/S/ Steven J. Sagers	
07/29/2016 10:52	07/29/2016 11:29	

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)

Dilution: 1

ND - Not Detected (U - Qualifier also flags analyte as not detected)

NA - Not Applicable

QC results are not adjusted for moisture correction, where applicable

QCS V4.1

Collector JONES SAF No.					41.0	THE PROPERTY OF STREET	For Ord oley	C.O.C. No. 20162151	51
Collector rones SAF No.						CHAIN OF COSTODI/SAMITLE ANALTSIS RECOEST		Page 1 of	3
SAF No.					Contact/Requestor		Telephone No373-6861	MSIN FAX 372-1878	1878
1/4			8		Sample Origin CARTRIDGE EVALUATION	MIION	Purchase Order/Charge Code 202003/cB20		
Project Title	ATION				Logbook/ Work Package No.	ackage No.	loe Chest No. UJTS- 013	Temp.	ICE
Shipped To (Lab)					Method of Shipment	ent	Bill of Lading/Air Bill No. 77	L8 4438	767
Protocol N/A	7				Data Turnaround		Parts and Return No. 4/107	1-	
Sample No.	Lab ID	•	Date	Time	No.∕Type Container	Sampl	Sample Analysis	4	Preservative
	S16T021945	V.	7/22/16	æ	CHARCOAL TUBE	Acetonitrile 16-06172-5-A1 (N/A	A
	S16T021946	5	7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-A2		N/A	×
	\$167021947	Š	7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-B1 3		N/A	8
	\$167021948	K.	7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-BLANK .		N/A	×
	\$167021949	Z,	7/22/16		CHARCOAL TUBE	Acetonitzile 16-06172-5-c1 ;		N/A	A
	S167021950	K.	7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-D1 '		N/A	A
	S16T021951	V.	VA 7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-E1		N/A	A
	S16T021952	VA	VA 7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-EFF-BASE ;		N/A	A.
	S16T021953	V.	7/22/16		CHARCOAL TUBE	Acetonitzile 16-06172-5-Fl 💉		N/A	Al.
	8161021954	VA	7/22/16		CHARCOAL TUBE	Acetonitrile 16-06172-5-61 A		N/A	A
POSSIBLE SAM	PLE HAZARDS/R	EMAP	KS (List all k	novm was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl W Enamideri.gov and Gregory_S_Mooreeri gov Too email	ald IV & Greg Moore i Gregory_S_Mooreërl.	Hold Time	
Relinquished By Print SLarow LVO 120 XV Relinquished BySW Harden WRPS <	SW Harder	3 7	Sign Sign 7	7-70-1	Date/Time	Received By Print Sign Scott Acade Sp. 44		Matrix*	= Drum Liquids = Tissue = Wipe
Relinquished By Relinquished By			April 1	3	Date/Time Date/Time	Received By ASSUE (4 will CM Received By	all other of the state of the s	= Sludge	= Liquid = Vegetation = Vapor = Other
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., F	Return to cust	omer, per	od (e.g., Return to customer, per lab procedure, ukad in process))	tary Disposed By Nath	Tuly 29, 2016 10	Date/Time	

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NSIN_T6-02 FAX 37						CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	LYSIS REQUEST	20162151	2151
ENGLAND Contact Cont						<u>{</u>			Page 2	
State Column State Column Col	Collector			Ĉ		Contact/Requesto	20		ž	72-1878
Substitution Supposed Work Package No. Date Time No.7tyse Container Supposed Work Package No. Date Time No.7tyse Container Supposed Work Package No. Date Time No.7tyse Container Supposed No. Date	SAF No.					Sample Origin	ALION	Purchase Order/Charge Code 202003/CB20		
Date Time No.Type Condition Sample Analysis Parts and Return No. 1/10 7/1	Project Title	LUATION				Logbook/ Work P.	ackage No.	loe Chest No. UJTS-013	1	W ICE
	Shipped To (La	(qı				Method of Shipme	ent	Bill of Lading/Air Bill No. 776		5296
Single-Lab Date Time No/Type Contained Acetonitrile 16-06172-5-H1 1.	Protocol 1/A					Data Turnaround		l lea	1001	
Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06172-5-E1 / Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06172-5-E1 / Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06173-5-A1 Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06173-5-B1 Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06173-5-B1 Signolisis Na 7/22/16 CHANCOAL TUBE Acetomitrile 16-06173-5-B1 Signolisis Signolisis Acetomitrile 16-06173-5-B1 Signolisis Signolisis Acetomitrile 16-06173-5-B1 Acetomitrile 16-061	Sample No.	Lab ID .	٠	Date	Time	No./Type Container	Samp	ole Analysis		Preservative
Signolumn Sign Curacora Tors Curacora Tors Acconductive 16-06172-5-13 1 1 1 1 1 1 1 1 1		\$161021955	\$			CHARCOAL TUBE				N/A
Signo Sign		S16T021956	\$			CHARCOAL TUBE	Acetonitrile 16-06172-5-H2 / ,			N/A
Signo1955 Yr 7/23/16 CRARCOLL TOSE Acetonitrile 16-06173-5-A1 1.	4	\$161021957	2	7/22/16		CHARCOAL TOBE	Acetonitrile 16-06172-5-IN-BASE V ,			N/A
Signo 17,23/16 CHARCOAL TUBE Acetonitrile 6-06173-5-12 #		8167021958	5	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-A1 1 .			N/A
Signo 1723/16 CHARCOAL TUBE Acetonitrile 16-06173-5=1		S16T021959	×	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-A2 (,			N/A
Sign		S16T021960	Y.	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-B1 #			N/A
Signo Date Ime		S16T021961	K	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-BLANK #			N/A
Signo Date/Time Sign Date/Time Received By Print Sign Date/Time Sign		S16T021962	Y.A.	7/23/16		CHARCOAL TUBE	Acetonitzile 16-06173-5-C1 ' .			N/A
SIGNO21964 IN 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-E1 APLE HAZARDS/REMARKS (List all known wastes) MSDS Yes O No Seed Results to Carl Howald IV & Greg Moore Carl Remains Federal School Results Sign Date/Time Received By Print Sign Date/Time Seedment WARPS SALL Sign Date/Time Received By Print Sign Date/Time Seedment WARPS SALL Sign Date/Time Received By FEDEX SALL SALL SALL WARPS SALL SALL SALL SALL SALL SALL SALL SALL 7-26-16 SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL SALL		S16T021963	N.	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-D1 /			N/A
APPLIAL INSTRUCTIONS Specific Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results to Cat I Blowald IV & Greg Moore Sept Results IV Andle Received By Print Sign Date/Time Sept Sept IV Andle Sept IV An		\$167021964	K	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-E1 ' .		: 5	N/A
WRPS Sign Date/Time Received By Print Sign Date/Time Matrix **SW Harder** **DATE/TIME Received By Harder** **DATE/TIME Received By Harder** **DATE/TIME No. DATE/TIME DATE/TIME	OSSIBLE SA	MPLE HAZARDS/R	EMA	RKS (List all k	rnown wast	es) MSDS O Yes	⁹² ⊙	24	Hold Time	
Date/Time Received By Disposed	Relinquished B	Sy Print Uel Bo. M. SW Harder WRPS	3 3	Sign	7.0%	Of 60 Date/Time	Print Sign Harde SeHL FEDEX	Date/Time SE Date/Time SE	e e	= Drum Liquids = Tissue = Wipe
Disposal Method (e.g., Return to customer, per lab procedure (used in process) group in July 2, 2016 10:30 gm	Relinquished E	AS AS		fedra		Date/Time	Jasel	ASQUI OF THE WAS DATESTING ON BE	old × × × × ×	= Vegetation = Vapor = Other
	FINAL SAMPLE DISPOSITION	Disposal	e.g.,	Return to cust	tomer, per l	ab procedure used in	year in year	1	F	0

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Contactive and a cont	Assembler N/A					OH C	CHAIN OF CHISTODY/SAMPI F ANALYSIS REQUEST	VSIS REQUEST	C.O.C. No. 20162151	2151
Comparing Comp										
Sample Code Communication	Collector					Contact/Requesto			MSIN F6-02 FAX 3	72-1878
Lightood Work Package No. Light Land No. Light	SAF No.					Sample Origin CARTRIDGE EVALU	ATION			
Date Time NorType Contained Sample Analysis Date Time NorType Contained Date Time Time Date Time Time Date Time Time Date Time Date Time Date Time Date Time Time Date Time Time Date Time Time Date Time	Project Title	LUATION				Logbook/ Work P.	ackage No.	loe Chest No. 4/75, O13	Temp. O.N.	HCE
Doba	Shipped To (La	ab)				Method of Shipme	ent	Bill of Lading/Air Bill No. 774	8 4438	5296
Lab ID - Date Time No/Type Container Sample Analysis Security	Protocol /A					Data Turnaround		Parts and Return No. 4/1	IN	
67021965 VA 7/23/16 CHARCOLL TUBE Acetonitrile 16-06173-5-E1 A 67021967 VA 7/23/16 CHARCOLL TUBE Acetonitrile 16-06173-5-E1 A 67021969 VA 7/23/16 CHARCOLL TUBE Acetonitrile 16-06173-5-E1 A 67021970 VA 7/23/16 CHARCOLL T	Sample No.	Lab		Date	Time	No /Type Container	Samp	ile Analysis		Preservative
### Sign		S16T021965	2	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-EFF-BASE \			N/A
67021967 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R1 (67021969 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R1 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2-R2 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2-R2 (67021970 VR 7/23/16 CRARCOAL TUBE Acetonitrile 16-06173-5-R2-R2 (67021970 VR 7/23/16 CRARCOAL TUBE ACETORICAL INSTRUCTIONS FINAL Sign CARCOAL TUBE ACCENCED BY FINAL SIGN CARL SIGN CONTINUE Acetorical Sign CARCOAL SIGN CARL SIGN		\$16T021966	V.	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-F1 4			N/A
67021956 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-R1 , 67021970 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-R2 , 67021970 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-R-BASS , 67021970 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-R-BASS , 67021970 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-R-BASS , 67021970 VA 7/23/16 CHARCOAL TUBE ACETONICATIONS 6707 VA 8004148		S16T021967	VA			CHARCOAL TUBE	Acetonitrile 16-06173-5-G1 A			N/A
61021970 VA 7/23/16 CHARCOAL TUBE Acetonitrile 16-06173-5-IN-BASE V. EHAZARDSIREMARKS (Let all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS EHAZARDSIREMARKS (Let all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS EHAZARDSIREMARKS (Let all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS EHAZARDSIREMARKS (Let all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS EACH BOARD STREAM CONTINUE OF THE STATE OF THE S		\$167021968	V.	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-H1 ,			N/A
EHAZARIOSIREMARKS (List all known washes) MSDS O Yes No SPECIAL INSTRUCTIONS See Brock Se		\$16T021969	VA	7/23/16		CHARCOAL TUBE	Acetonitrile 16-06173-5-H2			N/A
E HAZARDSIREMARKS (List all known wastes) MSDS O Yes		S16T021970	V.A.			CHARCOAL TUBE				N/A
E HAZARDS/REMARKS (List all known wastes) MSDS										
E HAZARDSIREMARKS (List all known wastes) MSDS O Yes © No SPECIAL INSTRUCTIONS RELEASE 9 Print Sign Date/Time Received By Print Sign T-26-16 OFOU S = Soil DIL Print Sign Date/Time Received By Print Sign T-26-16 OFOU S = Soil DIL PS STATE TAC-16 OFOU S = Soil DIL PS SOIL DATE/TIME SIGN SOIL S = Soil DIL PS SOIL DATE/TIME S = SOIL DATE/TIME S = SOIL DATE/TIME S = DAT										
Hold Time E HAZARDSIREMARKS (List all known wastes) MSDS O Yes No SPECIAL INSTRUCTIONS Send Results to Carl Bowald IV & Greg Moore Send Results to Carl Bowald IV & Greg Moore Send Results to Carl Bowald IV & Greg Moore Send Results to Carl Bowald IV & Greg Moore Send Results to Carl Bowald IV & Greg Moore Send Results to Carl Bowald IV & Greg Moore Second Bowald IV TOL -/6 OFOL Send BOWALD IV TOL -/6 OFOL SE										9
Print Sign Date/Time Received By Print Sign Date/Time South Date/Time Received By Print Sign Date/Time South Date/Time Received By Print Sign Date/Time South Date/Time South Will Date/Time Received By Date/Time Received By Disposed By Date/Time Date/Time South Will Date/Time	OSSIBLESA	MPLE HAZARDS/F	REMA	RKS (List all k	cnown wast		<i>§</i> ⊙		Hold Time	
Print Sign Date-Time Received By Print Sign Date-Time Matrix Harder Harder S. + H 7-26-16 / 0500 S = Soil DL Harder Harder S. + H 7-26-16 / 0500 S = Soil DL PS Specified Will Sign Date-Time Received By FEDEX Date-Time Received By Print Sign Date-Time SE = Soilment T SO = Soil Will Soil Soil Will Will Soil Soil Will Soil Soil Will Will Soil Soil Will Will Soil Soil Will Will Soil Soil Will Will Will Will Will Soil Will Will Will Will Will Will Will W							RELEASE 9 Reference Contract # 555	502	10	
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you Tely 29, 2016 10=30 Am	Relinquished E	Ás Ás		Jes	2	Date/Time	22880	Date/Time St.	olids × ≪ < r	= Liquid = Vegetation = Vapor = Other
	FINAL SAMPLE DISPOSITION	Disposal M	(e.g.	Return to cust	tomer, per l	lab procedure (used in	yours were you		Date/Time	
	All samples co	intaining hazardous.	mater	ials shall be p	icked up by	y requestor and returne	d to parent container or site of origin.		A-6	003-962 (03/05)

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FINAL REPORT ON MERCURY VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED JULY 22 – 23, 2016

Document No.: 20162164 Rev. 0

Michael A. Purcell WAI Hanford Laboratory

Date Published August 24, 2016



Prepared for:



Joyce A. Caldwell Washington River Protection Solutions, Inc. P.O. Box 850 Richland, WA 99352 509-376-0737 Prepared by:



WAI Hanford Laboratory 1955 Jadwin Ave, Suite 330 Richland, WA 99354 509-373-3240

August 24, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

FINAL REPORT ON MERCURY VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED JULY 22 – 23, 2016

This final report presents the results of twenty-six mercury vapor tubes received at the 222-S Laboratory from on July 25, 2016, in good condition and with adequate paperwork. The mercury vapor tubes were logged into sample delivery group 20162164.

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. C-3	LA-325-109, Rev. C-3

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 OAPP 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 9473 and 10187 were below the detection limit; therefore, no blank correction was required. All mercury results for this sample group were below the reporting limit of $0.05~\mu g/s$ ample, except for samples 16-06172-6-A1, 16-06172-6-H1, 16-06173-6-A1, and 16-06173-6-H1. For these samples, the total result includes the contribution from the glass wool portion even though the glass wool portion result is lower than the reporting limit (see Attachment 1).

Attachment 1

DATA SUMMARY REPORT

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162164

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-06172-6-A1	Total	S16T022211	Mercury	μg/sample	n/a	< 0.0500	0.223	0.0500
16-06172-6-A1	Resin	S16T022214	Mercury	μg/sample	89.0	< 0.0500	0.218	0.0500
16-06172-6-A1	Glass Wool	S16T022215	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-A2	Total	S16T022217	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-A2	Resin	S16T022218	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-A2	Glass Wool	S16T022221	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-B1	Total	S16T022228	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-B1	Resin	S16T022231	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-B1	Glass Wool	S16T022232	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-BLANK	Total	S16T022234	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-BLANK	Resin	S16T022235	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-BLANK	Glass Wool	S16T022236	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-C1	Total	S16T022238	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-C1	Resin	S16T022241	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-C1	Glass Wool	S16T022242	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-D1	Total	S16T022243	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-D1	Resin	S16T022245	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-D1	Glass Wool	S16T022246	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-E1	Total	S16T022247	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-E1	Resin	S16T022250	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-E1	Glass Wool	S16T022251	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-EFF-BASE	Total	S16T022252	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-EFF-BASE	Resin	S16T022253	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-EFF-BASE	Glass Wool	S16T022254	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-F1	Total	S16T022255	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-F1	Resin	S16T022256	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-F1	Glass Wool	S16T022257	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-G1	Total	S16T022258	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-G1	Resin	S16T022259	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-G1	Glass Wool	S16T022260	Mercury	μg/sample	89.0	< 0.0500	< 0.0500	0.0500
16-06172-6-H1	Total	S16T022261	Mercury	μg/sample	n/a	< 0.0500	0.210	0.0500
16-06172-6-H1	Resin	S16T022263	Mercury	μg/sample	92.4	< 0.0500	0.205	0.0500
16-06172-6-H1	Glass Wool	S16T022264	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06172-6-H2	Total	S16T022267	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-H2	Resin	S16T022269	Mercury	µg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06172-6-H2	Glass Wool	S16T022270	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06172-6-IN-BASE	Total	S16T022273	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06172-6-IN-BASE	Resin	S16T022274	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06172-6-IN-BASE	Glass Wool	S16T022275	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-A1	Total	S16T022282	Mercury	μg/sample	n/a	< 0.0500	0.225	0.0500
16-06173-6-A1	Resin	S16T022283	Mercury	μg/sample	92.4	< 0.0500	0.220	0.0500
16-06173-6-A1	Glass Wool	S16T022284	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-A2	Total	S16T022285	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-A2	Resin	S16T022286	Mercury	μg/sample	92.4	<0.0500	<0.0500	0.0500
16-06173-6-A2	Glass Wool	S16T022287	Mercury	ug/sample	92.4	<0.0500	<0.0500	0.0500
16-06173-6-B1	Total	S16T022288	Mercury	μg/sample	n/a	<0.0500	< 0.0500	0.0500
16-06173-6-B1	Resin	S16T022289	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-B1	Glass Wool	S16T022290	Mercury	µg/sample	92.4	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162164

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-06173-6-BLANK	Total	S16T022491	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-BLANK	Resin	S16T022492	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-BLANK	Glass Wool	S16T022493	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-C1	Total	S16T022494	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-C1	Resin	S16T022495	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-C1	Glass Wool	S16T022496	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-D1	Total	S16T022497	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-D1	Resin	S16T022498	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-D1	Glass Wool	S16T022499	Mercury	µg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-E1	Total	S16T022500	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-E1	Resin	S16T022501	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-E1	Glass Wool	S16T022502	Mercury	μg/sample	92.4	< 0.0500	< 0.0500	0.0500
16-06173-6-EFF-BASE	Total	S16T022503	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-EFF-BASE	Resin	S16T022504	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-EFF-BASE	Glass Wool	S16T022505	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-F1	Total	S16T022506	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-F1	Resin	S16T022507	Mercury	µg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-F1	Glass Wool	S16T022508	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-G1	Total	S16T022520	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-G1	Resin	S16T022524	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-G1	Glass Wool	S16T022525	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-H1	Total	S16T022528	Mercury	µg/sample	n/a	< 0.0500	0.237	0.0500
16-06173-6-H1	Resin	S16T022529	Mercury	µg/sample	94.4	< 0.0500	0.232	0.0500
16-06173-6-H1	Glass Wool	S16T022530	Mercury	µg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-H2	Total	S16T022531	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-H2	Resin	S16T022532	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-H2	Glass Wool	S16T022533	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-IN-BASE	Total	S16T022535	Mercury	μg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-06173-6-IN-BASE	Resin	S16T022538	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500
16-06173-6-IN-BASE	Glass Wool	S16T022539	Mercury	μg/sample	94.4	< 0.0500	< 0.0500	0.0500

Attachment 2

ANALYSIS DATE REPORT

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162164

		OKT TOKE	MPLE GROUP 201	
Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T022214	16-06172-6-A1	Mercury	07/28/2016 17:00	07/28/2016 19:07
S16T022215	16-06172-6-A1	Mercury	07/28/2016 17:00	07/28/2016 19:09
S16T022218	16-06172-6-A2	Mercury	07/28/2016 17:00	07/28/2016 19:11
S16T022221	16-06172-6-A2	Mercury	07/28/2016 17:00	07/28/2016 19:13
S16T022231	16-06172-6-B1	Mercury	07/28/2016 17:00	07/28/2016 19:14
S16T022232	16-06172-6-B1	Mercury	07/28/2016 17:00	07/28/2016 19:16
S16T022235	16-06172-6-BLANK	Mercury	07/28/2016 17:00	07/28/2016 19:21
S16T022236	16-06172-6-BLANK	Mercury	07/28/2016 17:00	07/28/2016 19:23
S16T022241	16-06172-6-C1	Mercury	07/28/2016 17:00	07/28/2016 19:24
S16T022242	16-06172-6-C1	Mercury	07/28/2016 17:00	07/28/2016 19:26
S16T022245	16-06172-6-D1	Mercury	07/28/2016 17:00	07/28/2016 19:28
S16T022246	16-06172-6-D1	Mercury	07/28/2016 17:00	07/28/2016 19:30
S16T022250	16-06172-6-E1	Mercury	07/28/2016 17:00	07/28/2016 19:31
S16T022251	16-06172-6-E1	Mercury	07/28/2016 17:00	07/28/2016 19:33
S16T022253	16-06172-6-EFF-BASE	Mercury	07/28/2016 17:00	07/28/2016 19:35
S16T022254	16-06172-6-EFF-BASE	Mercury	07/28/2016 17:00	07/28/2016 19:36
S16T022256	16-06172-6-F1	Mercury	07/28/2016 17:00	07/28/2016 19:41
S16T022257	16-06172-6-F1	Mercury	07/28/2016 17:00	07/28/2016 19:43
S16T022259	16-06172-6-G1	Mercury	07/28/2016 17:00	07/28/2016 19:44
S16T022260	16-06172-6-G1	Mercury	07/28/2016 17:00	07/28/2016 19:46
S16T022263	16-06172-6-H1	Mercury	07/28/2016 17:00	07/28/2016 19:53
S16T022264	16-06172-6-H1	Mercury	07/28/2016 17:00	07/28/2016 19:55
S16T022269	16-06172-6-H2	Mercury	07/28/2016 17:00	07/28/2016 20:04
S16T022270	16-06172-6-H2	Mercury	07/28/2016 17:00	07/28/2016 20:06
S16T022274	16-06172-6-IN-BASE	Mercury	07/28/2016 17:00	07/28/2016 20:08
S16T022275	16-06172-6-IN-BASE	Mercury	07/28/2016 17:00	07/28/2016 20:10
S16T022283	16-06173-6-A1	Mercury	07/28/2016 17:00	07/28/2016 20:11
S16T022284	16-06173-6-A1	Mercury	07/28/2016 17:00	07/28/2016 20:13
S16T022286	16-06173-6-A2	Mercury	07/28/2016 17:00	07/28/2016 20:15
S16T022287	16-06173-6-A2	Mercury	07/28/2016 17:00	07/28/2016 20:17
S16T022289	16-06173-6-B1	Mercury	07/28/2016 17:00	07/28/2016 20:18
S16T022290	16-06173-6-B1	Mercury	07/28/2016 17:00	07/28/2016 20:20
S16T022492	16-06173-6-BLANK	Mercury	07/28/2016 17:00	07/28/2016 20:25
S16T022493	16-06173-6-BLANK	Mercury	07/28/2016 17:00	07/28/2016 20:27
S16T022495	16-06173-6-C1	Mercury	07/28/2016 17:00	07/28/2016 20:29
S16T022496	16-06173-6-C1	Mercury	07/28/2016 17:00	07/28/2016 20:30
S16T022498	16-06173-6-D1	Mercury	07/28/2016 17:00	07/28/2016 20:32
S16T022499	16-06173-6-D1	Mercury	07/28/2016 17:00	07/28/2016 20:34
S16T022501	16-06173-6-E1	Mercury	07/28/2016 17:00	07/28/2016 20:35
S16T022502	16-06173-6-E1	Mercury	07/28/2016 17:00	07/28/2016 20:37
S16T022504	16-06173-6-EFF-BASE	Mercury	08/08/2016 07:30	08/08/2016 11:56
S16T022505	16-06173-6-EFF-BASE	Mercury	08/08/2016 07:30	08/08/2016 11:58
S16T022507	16-06173-6-F1	Mercury	08/08/2016 07:30	08/08/2016 11:59
S16T022508	16-06173-6-F1	Mercury	08/08/2016 07:30	08/08/2016 12:01
S16T022524	16-06173-6-G1	Mercury	08/08/2016 07:30	08/08/2016 12:03
S16T022525	16-06173-6-G1	Mercury	08/08/2016 07:30	08/08/2016 12:05

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162164

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T022529	16-06173-6-H1	Mercury	08/08/2016 07:30	08/08/2016 12:10
S16T022530	16-06173-6-H1	Mercury	08/08/2016 07:30	08/08/2016 12:12
S16T022532	16-06173-6-H2	Mercury	08/08/2016 07:30	08/08/2016 12:13
S16T022533	16-06173-6-H2	Mercury	08/08/2016 07:30	08/08/2016 12:15
S16T022538	16-06173-6-IN-BASE	Mercury	08/08/2016 07:30	08/08/2016 12:16
S16T022539	16-06173-6-IN-BASE	Mercury	08/08/2016 07:30	08/08/2016 12:18

Attachment 3

RECEIPT PAPERWORK

				HAIN OF CUSTODY HECKLIST ATS-LO-090-101 Rev DG - 1
Date Samples Received: 7-25-1	4 T	otal N	Numb	er of Samples: 312 Group #: 2016 2164-1
Sample Custodian: TERESA FRA				IH Technician: Dell American
			Cust	odian to Complete:
Action	Yes	No	N/A	Comments
RSR provided?		1	7	
Verify GKI is complete			7	☐ In Project File
Received from an alpha facility?		7	J.W.	Contact PC for approval to release
Check that outer custody seal is intact, if present			7	, ,
Record cooler temperature in centigrade, as appropriate	4.0			Check if no cooler and/or no ice
Samples are intact and in good condition	7			If No, provide comments below
RSA/COC provided and complete containing the following information?		100		
Client name and client sample number	7			A management of the second sec
Date and time of sampling	7			
Sampling location or origin	7			
Container type, size, and number	7			
 Preservatives (if used) noted on the COC/RSA and sample bottles 	1	-	7	,
Analysis request is clear	7			
 Signature of persons relinquishing and receiving samples 	7			
 Date and/or time of sample custody exchange 	7		7	
erify that sample numbers on containers natch the COC and/or RSA	7			
amples stored properly (e.g., refrigeration)	1			
lotify the PC immediately if any problems ne initials block below is completed by the	are not	ed. A	Iny "N WRP	lo" checked boxes require PC resolution. For WRPS samples,
amples acceptable for release? Yes				Date 7-25-16
No comment on communication and resorted the WRPS - Ship _ 182	olution:			Cut 4/25/16
Dun -78 WHL - NH3 - 26 Hg - 26				
umber of IH Samples Received:	,	4	ce t	onitrile 26
ldehyde Screen: 26 Amines: 2	<i>b</i> _	Am	monia	: 26 Aromatic HC: Asbestos:
Beryllium: Be-Bulk:		Ве	-Filter	
Formaldehyde: Furans:	26	M	ercury	Methanol: Nitrosamines: 26
Nitrous Oxide: Pyridines:	26		SVOA	26 VOA: 26 Other-IH:

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: W	/ashingto	n River Pro	tection Solu	utions					Date	Sample	1: (07/22/2016
CACN: 20	236	7 2070	COA:	CB20	_	Survey	No.: 16-06	172 -				
Contact Name:					Phone: (5	09)373-4966				und: N//		oung / (r un
Return Report	To: Ca	aldwell, Joyc	e A				MSIN:					509)376-073
Laboratory Log No.	San	nple ID/Ty	pe/Descr	iption		4				equired A		
	16-0	06172-3-E	FF-BASE	/ TDU (T	enax)				Fu	ırans		
						H				er	23	46
	16-0	6172-3-F	1 / TDU (Tenax)					Fu	rans		
		IJAHUU				-						
		6172-3-G							Fu	rans	_	
	100001		THIAM	JUHLU						ialis		
	16-06	6172-3-H1	/TDU (enax)					Fu	rans		· · ·
										uns		
	16-06	3172-3-H2	/ TDU (T	enax)					Fur	ans		
	1000							-				
	16-06	172-3-IN-	BASE / T	DU (Tena	x) .				Fun	one		
	100000000									allo		
22211	16-06	172-6-A1	/ Hydrar (SKC 226-	17-1A) SI	7022	214		Ha-	Elementa		
167022211						7022					•	,
10222217	16-061	172-6-A2	Hydrar (SKC 226-	17-1A) SI	57022	218		Hg-I	Elementa		
100					3	6T022	1221		1.			
ecial Instructions	S: 1	1/14										
			nature		Printed Na	ne	Loca	tion		Date	_	Time
livered to Storage		Atr	-	70	h Wilhel	m 2	704 HV -		1061			Time
trieved from Stor	age:	ell &	lai	1 ~	(Spaced		ייין ויין		107	7/23/1		0700
		- 9			75014					1-63-	6	0715
		Signatu	re		Prin	ted Name		T	Dat	e		Time
linquished By:	della	Spanle	ling)	De	1/5000	Hine		Τ.	7-25-	"	- 11	00
ceived By:	Texes	e For	45	TE	LESA F	PARESTE	S.R.	- 1	7-25-			00
inquished By:									-	, ,		
ceived By:												
inquished By:											_	
eived By:												

- Chain or Custody

20162164 Rev. 0 INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contact Name: Jones, Pake Contact Name: Jones Sampled: 07222016 Contact Name: Jones, Pake Phone: (509)373-4966 Turnaround: N/A Return Report To: Cadwel, Joyce A MSIN: R1-06 Phone: (509)376-0737 Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required Analysis Required A	Contractor: V	Vashing	ton River Protection Solut	tions					Date	Sample	d. 0	710010010
Contact Name: Jones Max Phone: (508)373-4966 Turnaround: NA Return Report To: Cativell, Joyce A MSIN: R1-06 Phone: (508)376-0737 Laboratory L		236				Surve	v No.:	16-0617				
Return Report To: Caldwell, Joyce A	Contact Name:	Jone			Phone: (5			10-00172				sting A Farm
Laboratory Log No. Sample ID/Type/Description Required Analysis 16-06172-6-B1 / Hydrar (SKC 226-17-1A)	Return Report	To: (Caldwell, Joyce A		(0		1	MSIN:				0000000000
16-06172-6-G1 / Hydrar (SKC 226-17-1A) S 16 70 222 36 Hg-Elemental S 16 70 222 41 Hg-Elemental S 16 70 222 42 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 52 Hg-Elemental S 16 70 222 54 Hg-Elemental S 16 70 222 55 Hg-Elemental S 16 70 222 56 Hg-Elemental S 16 7	Laboratory	Sar		tion								
16-06172-6-G1 / Hydrar (SKC 226-17-1A) S 16 70 222 36 Hg-Elemental S 16 70 222 41 Hg-Elemental S 16 70 222 42 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 52 Hg-Elemental S 16 70 222 54 Hg-Elemental S 16 70 222 55 Hg-Elemental S 16 70 222 56 Hg-Elemental S 16 7	20228	16-	06172-6-B1 / Hydrar	(SKC 226	S-17-1A)	S16 To	222	31	y	Ha-Flem	ental	
16-06172-6-G1 / Hydrar (SKC 226-17-1A) S 16 70 222 36 Hg-Elemental S 16 70 222 41 Hg-Elemental S 16 70 222 42 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 45 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 50 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 51 Hg-Elemental S 16 70 222 52 Hg-Elemental S 16 70 222 54 Hg-Elemental S 16 70 222 55 Hg-Elemental S 16 70 222 56 Hg-Elemental S 16 7	26700										ontai	
16-06172-6-C1 / Hydrar (SKC 226-17-1A)	22234	16-0	06172-6-BLANK / Hyd	drar (SKC	226-17-1A) '516"	102	22.35		Ha-Fleme	antal	
16-06172-6-C1 / Hydrar (SKC 226-17-1A)	5167000	1100							1	ng Elona	untai	
16-06172-6-D1 / Hydrar (SKC 226-17-1A) : S(L TO 222 45 Hg-Elemental S/6 TO 222 45 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO 222 51 Hg-Elemental S/6 TO 222 52 Hg-Elemental S/6 TO 222 52 Hg-Elemental S/6 TO 222 54 Hg-Elemental S/6 TO 222 55 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO	222238	16-0)6172-6-C1 / Hydrar (SKC 226	-17-1A) ·	516T	025	241	7	Ha-Eleme	ental	
16-06172-6-D1 / Hydrar (SKC 226-17-1A) : S(L TO 222 45 Hg-Elemental S/6 TO 222 45 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO 222 51 Hg-Elemental S/6 TO 222 52 Hg-Elemental S/6 TO 222 52 Hg-Elemental S/6 TO 222 54 Hg-Elemental S/6 TO 222 55 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 57 Hg-Elemental S/6 TO 222 50 Hg-Elemental S/6 TO	516700		UN DEN FERDI OCENT BEHR HER FERDI DER FERDE BER			51670	0227	242		- J		
16-06172-6-E1 / Hydrar (SKC 226-17-1A) . S16 TO 222 50 Hg-Elemental S16 TO 222 51 Hg-Elemental S16 TO 222 53 Hg-Elemental S16 TO 222 54 Hg-Elemental S16 TO 222 56 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 225 51 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 225 50 Hg-Elemental S16 TO 25 50 Hg-Elemental S16 TO 25 50 Hg-El	2243	16-0	6172-6-D1 / Hydrar (SKC 226	-17-1A) <i>:</i>	5167	022	245	F		ntal	
16-06172-6-E1 / Hydrar (SKC 226-17-1A) . S16 TO 222 50 Hg-Elemental S16 TO 222 51 Hg-Elemental S16 TO 222 53 Hg-Elemental S16 TO 222 54 Hg-Elemental S16 TO 222 56 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 57 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 225 51 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 222 50 Hg-Elemental S16 TO 225 50 Hg-Elemental S16 TO 25 50 Hg-Elemental S16 TO 25 50 Hg-El	540TO2.	IIIII				516 T	022	246				
16-06172-6-EFF-BASE / Hydrar (SKC 226-17-1A) SIL 7022254 Hg-Elemental	-12247	16-0	6172-6-E1 / Hydrar (\$	SKC 226-	-17-1A) ,	516 TO	022	2 50	F	lg-Eleme	ntal	,
16-06172-6-EFF-BASE / Hydrar (SKC 226-17-1A) SIL 7022254 Hg-Elemental	516 702		1 100 100 100 100 100 100 100 100 100 1			516T	022	251				
16-06172-6-F1 / Hydrar (SKC 226-17-1A) : \$16 7022 \$6 Hg-Elemental	22252	16-0	6172-6-EFF-BASE / H	Hydrar (S	KC 226-17-	1A) 516	702	2253	H	lg-Eleme	ntal	-
16-06172-6-F1 / Hydrar (SKC 226-17-1A) : \$16 7022 \$6 Hg-Elemental	316702					516	700	2225	1			
Special Instructions: Signature Signature Signature Printed Name Delivered to Storage: Signature Signature Printed Name Deli Spaulding Printed Name Date Time Delinquished By: Signature Printed Name Date Time Deli Spaulding Teresa Forasster Teresa Forasster Secrived By: Secrived By: Secrived By: Secrived By: Secrived By: Signature Printed Name Date Time Tool US paulding Teresa Forasster Teresa Forasster Teresa Forasster Teresa Forasster Teresa Forasster Secrived By: Secrived By: Secrived By: Secrived By: Secrived By: Signature Signature Printed Name Date Time Tool Secrived By: Signature Printed Name Date Time Teresa Forasster Teresa Forasster Teresa Forasster Secrived By: Secrived By:	-1255	16-06	3172-6-F1 / Hydrar (S	SKC 226-	17-1A) :	516	T02	2256	Н	g-Elemer	ntal	
Special Instructions: Signature Signature Signature Printed Name Delivered to Storage: Signature Signature Printed Name Deli Spaulding Printed Name Date Time Delinquished By: Signature Printed Name Date Time Deli Spaulding Teresa Forasster Teresa Forasster Secrived By: Secrived By: Secrived By: Secrived By: Secrived By: Signature Printed Name Date Time Tool US paulding Teresa Forasster Teresa Forasster Teresa Forasster Teresa Forasster Teresa Forasster Secrived By: Secrived By: Secrived By: Secrived By: Secrived By: Signature Signature Printed Name Date Time Tool Secrived By: Signature Printed Name Date Time Teresa Forasster Teresa Forasster Teresa Forasster Secrived By: Secrived By:	3167000	Minn				516	702	2257).			
Signature Printed Name Location Date Time Delivered to Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Signature Printed Name Date Time Retelinquished By: John April 1000 Received By: Tenesa Formester 7-25-16 1100 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved Retrieved Name Date Time Time Time Tenesa Formester 7-25-16 1100 Retrieved By: Retrieved Re	52,58	16-06	3172-6-G1 / Hydrar (S	SKC 226-	17-1A) ,					g-Elemer	ntal	
Signature Printed Name Location Date Time Delivered to Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Signature Printed Name Date Time Retelinquished By: John April 1000 Received By: Tenesa Formester 7-25-16 1100 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved Retrieved from Storage: John Wilhelm 2704 Hv - H104 7/23/16 0700 Retrieved Retrieved Name Date Time Time Time Tenesa Formester 7-25-16 1100 Retrieved By: Retrieved Re	3167022		14 14 14 14 14 14 14 14 14 14 14 14 14 1						- 1	•	х.	
Signature Printed Name Location Date Time Delivered to Storage: Foll Sparling 2704 Hv - H104 7/23/16 0700 Retrieved from Storage: Foll Sparling 7-25-16 0715 Signature Printed Name Date Time Relinquished By: Fell Sparling 7-25-16 1100 Received By: Rece		is:	NIA								_	
Retrieved from Storage: Fell Spaulary Dell Spaularing 7-25-16 07/5 Signature Printed Name Date Time Relinquished By: Pell Spaularing 7-25-16 1100 1100 1100 1100 1100 1100 1100 1					Printed Na	ime		Location	on	Dat	e	Time
Signature Printed Name Date Time Relinquished By: Sell Aparella Dell Spackling 7-25-16 1100 Received By: Received By: Parella Teresa Forcester 7-25-16 1100 Received By: Re			Ale	2	osh Will	elin	270	4 HV -	H104	7/23/	16	0700
Signature Printed Name Date Time delinquished By: Sell Aparellia Dell Spackling 7-25-16 1100 deceived By: Tenesta Tenesta Fornester 7-25-16 1100 delinquished By: delinquished By: delinquished By: delinquished By: deceived By:	Retrieved from Sto	orage:	Dell Spale	y De	ll Spavla	ling			V V	7-25	-16	
delinquished By: Dell Spackling 7-25-16 1100 Deceived By: Dell Spackling 7-25-16 1100 TERESA FORRESTER 7-25-16 1100 Delinquished By: Dell Spackling 7-25-16 1100 Delinquished By: Delinquished By: Dell Spackling 7-25-16 1100					· ·							
eceived By: Compared to the particle of the		0	Signature		Prir	nted Nam	ie		Da	ate		Time
elinquished By: eceived By: eceived By: eceived By:		Del	Spanispi	, De	Il Spa	chel	ing		7-29	5-16	11	00
eceived By: elinquished By: eceived By:		Ten	s. Taresta	TE	CESA FO	RRESTE	er/		7-25	5-16	11	00
elinquished By: eceived By:												
eceived By:												
dulional Comments:												
	udidonal Commer	its:										

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor:	Vashing	ton River Protection Solutions		·			Data	Sampled		710010010
CACN: 20	771	7 202003 COA: CB		Surve	/ No : 16-061					ting A Farm
Contact Name	: Jone	s, Parker [/25/16		509)373-496				und: N/A		ting A Farm
Return Report				000/010 400	MSIN:					00/070 0707
Laboratory Log No.	Sa	mple ID/Type/Description	n		I WOINT	171-0		equired A		09)376-0737 ysis
اعدافا	16-	06172-6-H1 / Hydrar (SI	KC 226-17-1A)	5167	022263		TH.	g-Elemer	ntal	
Sho Torrial	1920				022264			y Elemen	itai	
2226	7 16-	06172-6-H2,/ Hydrar (Sh	(C 226-17-1A)	516 T	02226	9	V H	g-Elemen	tal	
516 1022 6					0222					
20 13	16-0	06172-6-IN-BASE / Hydr	rar (SKC 226-17-				Ho	j-Elemen	tal	
516 10 722 13	1/00/2018				T0222			,		
	16-0	06172-7-A1 / CISA (SKC	226-29)				NF	13		
								(M	3-14
	16-6	6172-7-A2 / CISA (SKC	226-29)				N	13	-7	
	HARM	TERRITORIES CONTRACTORISMO					7			
	16-0	6172-7-B1 / CISA (SKC	226-29)				NH	3		7
		E PRI NERO EDISE BRID KAR ARTIK NO ADAR KAD ROKKU D					-			
	16-0	6172-7-BLANK LetSA (SKC 226-29)				NH	3		
,				. 7						
	16-08	8172-7-C1 / CISA (SKC	226-29)				ин	3		
/									_	
Special Instruction	ns: ,	NA								Laconson
-		Signature	Printed N	ame	Loca	ition		Date		Time
Delivered to Stora		The.	Josh Will	relm	2704HV-	-11/0	94	7/23/1	6	0700
Retrieved from Sta	orage:	Sell spadice	Dell Space	ling				7-25-	7	0715
			,							
Relinquished By:	0	Signature	-	nted Nam	e		Dat	te		Time
Received By:	Del	Spaulstry	Dell Spa	Uld In	9	7	- 25-	-16	11	00
Relinquished By:	Cere	o tomesto	TERESA FO	DRREST	er	17	7-25-	-16	110	0 0
Received By:						+				
Relinquished By:						+-				
eceived By:						+				
dditional Commer	nts:								_	

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INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor								
	ashington River Prote							07/23/2016
CACN: 202367 Contact Name:		COA: CB20		Survey No.	: 16-06173	- Respirato	r Cartridge	Testing A Farr
			Phone: (50	9)373-4966		Turnarou	ind: N/A	
	To: Caldwell, Joyce	e A			MSIN: F	R1-06	Phone	: (509)376-07
Laboratory Log No.	Sample ID/Typ					Re	quired A	nalysis
	16-06173-3-E	FF-BASE / TD	U (Tenax)			Fui	rans	
				1				
	16-06173-3-F1	TDU (Tenax	()			Fur	ans	
			HH					
	16-06173-3-G1	/ TDU (Tenax	()	arm me		Fur	ans	
			The same			"	4110	
	16-06173-3-H1	/ TDU (Tenax	:)		a house a	Fura	ans	
		HADOTÉ ÚDIL DI MATA AR						
	16-06173-3-H2	/ TDU (Tenax)			Fura	ine	
						unit		
	16-06173-3-IN-	BASE / TDU (Tenax)			Fura	ns	
7.254								
22.82	16-06173-6-A1	/ Hydrar (SKC	226-17-1A) _	5/6/022:	283	Hg-E	Iementa	1
1022285				5167022				
122285	16-06173-6-A2	Hydrar (SKC	226-17-1A) SI	67022	2856	7/2-2/Hg-E	lemental	
lle 10-			 ' 5	6T022	2588	7		
pecial Instructions	s.				384			
	<u></u>				7.25-14			
		nature	Printed Nar	ne	Location		Date	Time
elivered to Storag	Sign ge: Hand S	nature			Locatio		Date	
elivered to Storag	Sign ge: Hand S	nature	Gerrade Sa	en 7 270			7-23-	16 2359
	Sign ge: Hand S	nature	Gerrade Sa		Locatio			16 2359
etrieved from Stor	Sign ge: Hand S	Jam	Gernada Sa BRETT GA	en 7 270	Locatio		7-23- 7-25-	16 2359
etrieved from Stor	Signification Si	Jam	Gerrada Sc. BRETT GA	ENT 270	Locatio	4/04	7-23- 7-25-	7 Time
etrieved from Stor elinquished By: eceived By:	Signification Si	Jam	Gerrade Sc BRETT GA Print BRETT G	RWER 270 RWER Mame	Location by HV/	Dat	7-23-7-25-1	7/.'Q
etrieved from Stor elinquished By: eceived By: elinquished By:	Signification Si	Jam	Gerrade Sc BRETT GA Print BRETT G	RWER 270	Location by HV/	4/04	7-23-7-25-1	7/.'Q
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etrieved from Stor elinquished By: eceived By: elinquished By: eceived By:	Signatu Signatu	Jam	Gerrade Sa BRETT GA Print BRETT G	RWER 270 RWER Mame	Location by HV/	Dat	7-23-7-25-1	7/.'Q

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INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

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N

Contractor: W	Vashing	ton River Protect	tion Solutions						Da	to S	amples		7/23/2016	_
CACN: _202367	202	003	COA: CB2			Surve	y No.:	16-0617					ting A Fan	
Contact Name:	Jone	5, Parker L			Phone: (T		nd: N/A		aing A Fan	n
Return Report	To:	Caldwell, Joyce A	9					MSIN:	R1-06				09)376-07	27
Laboratory Log No.	Sar	mple ID/Type/	Description	1					8	Re	equired			31
122288	16-0	06173-6-B1 /	Hydrar (SK	C 226	-17-1A)	51670	222	289		Н	g-Eleme	ental		_
Log No. 288	7-11	Thurst man				SIGT	027:	290		'				
1222 HAL	16-0	06173-6-BLAN	NK / Hydrar	(SKC	226-17-1A	1) 516	TOZZ	2192	2	Hg	-Eleme	ntal		_
3670272 491	1 DOOR BY RO					•		2493						
3167022494	16-0	06173-6-C1 / F	Hydrar (SK	C 226-	-17-1A)	5167				Hg	-Eleme	ntal		
516	I AMAIN					5167	022	24-94	,					
516TO22497	16-0	6173-6-D1 / H	lydrar (SK	C 226-	17-1A)	516 T				Hg	-Elemer	ntal		_
516700					,	5167	SSO	499						,
122500	16-0	6173-6-E1 / H	ydrar (SKC	226-	17-1A)	5/67	102	2 501		Hg-	-Elemer	ntal		
3117022500	-					S167	TO 20	2502	_					
22503	16-06	6173-6-EFF-B	ASE / Hyd	rar (Sł	C 226-17-	1A) S	167	02250	54	Hg-	Elemen	tal		_
5167022503	im in	NE HAN TALI DIA KAN TALI			PAR DAN AN AN			0225	- 1					
506	16-06	3173-6-F1 / Hy	drar (SKC	226-1	7-1A)	51670				Hg-	Elemen	tal		_
SILET ON 506	THE REAL					51670		,						
2520	16-06	173-6-G1 / H	ydrar (SKC	226-1	7-1A) 4	S[670	22	524		Ha-l	Element	el e		_
167022520					,	5167				9 .		ai		
pecial Instruction	s:							00.0						_
		Signa	ture	T	Printed Na	ame		Location	on	7	Date		Time	
elivered to Storag		Sunt 8	~~	Ger	rado Sa	en Z	270	4 40/	4 10	4		-	2359	_
etrieved from Sto	rage:	Sut De	in.	RR	ET CO	MATER					7-25-	-	074	_
				B	KETT GA	WIVER					- 0-5	,0	0,4	<u>×</u>
elia essiala a I D	2	Signature			Prir	nted Nam				Date			Time	_
elinquished By:		and an	m	1/2	REIT	GARU	EL		7/2	5/	16	//	:00	
eceived By: elinquished By:	L	exection	5	Le	5/10	DIAZ			7/2	5//	6	11	1:00	
eceived By:														
elinquished By:														_
eceived By:														_
Iditional Comment	ts:													_
														_

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Wa	ashington River Protect	ction Solutions				Date	Sample	d: 07	7/23/2016
CACN: -202307		COA: CB20		Survey I	No.: 16-06173		ator Cartrido		
Contact Name:	Johes, Parker L		Phone: (50				ound: N/		ung A Farm
Return Report T	o: Caldwell, Joyce	A	(00	7010 1000	MSIN: F				09)376-0737
Laboratory Log No.	Sample ID/Type	e/Description					Required		
122528	16-06173-6-H1	/ Hydrar (SKC	226-17-1A)	51670	22 529	-	Hg-Eleme	ental	
516 7022528		maniamini			022530				
122,531	16-06173-6-H2	/ Hydrar (SKC	226-17-1A)		022532		Hg-Eleme	ntal).
5167022531	Markware				022533				
1022535	16-06173-6-IN-E	BASE / Hydrar	(SKC 226-17-1A) S16	TOZZ538	I	Hg-Eleme	ntal	
516 7022535				SIG	7022539				
	16-06173-7-A1 /	CISA (SKC 22	26-29)			1	NH3		
		MERRANA							
	16-06173-7-A2 /	CISA (SKC 22	26-29)			1	NH3		
	wasama	m sararak il s							
	16-06173-7-B1 /	CISA (SKC 22	26-29)			N	IH3		
			11						
	16-06173-7-BLA	NK / CISA (SK	C 226-29)			A	НЗ		
								,	
	16-06173-7-C1 /	CISA (SKC 22	6-29)			N	H3	_	
			H						
Special Instructions	:								
		nature	Printed Nar	ne	Locatio	n	Da	te	Time
Delivered to Storage	Marie Contract	Sun	Ferrade So	enz 2	270440/	4104	7-23	-16	2359
Retrieved from Stor	age:	Lam 1	BRETT GA	RVER			7-29	-16	0742
	Signatur	re	Print	ed Name			Date	T-	Time
Relinquished By:	Settlan	en E	REIT G.	KRUE	R	7/25	116	11	1:00
Received By:	Kiefu Si	2	eslie Di	Aż		7/2	5/16		100
Relinquished By:	- Compre)				,			
Received By:									
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leceived By:									
dditional Comment	s:								

C.3.7 Ammonia

20162135 Rev. 0

FINAL REPORT ON AMMONIA VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED JULY 22 – 23, 2016

Document No.: 20162135 Rev. 0

Michael A. Purcell WAI Hanford Laboratory

Date Published August 18, 2016



Prepared for:



Joyce A. Caldwell Washington River Protection Solutions, Inc. P.O. Box 850 Richland, WA 99352 509-376-0737 Prepared by:



WAI Hanford Laboratory 1955 Jadwin Ave, Suite 330 Richland, WA 99354 509-373-3240

August 18, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

FINAL REPORT ON AMMONIA VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED JULY 22 – 23, 2016

This final report presents the results of twenty-six ammonia vapor tubes received at the 222-S Laboratory on July 25, 2016, in good condition and with adequate paperwork. The samples were logged into sample delivery group 20162135.

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. 2-5				

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 88 - 107%, 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. Fifteen of the twenty-six ammonia results for sample group 20162135 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). For sample 16-06173-7-D1, the back resin portion result was greater than the front resin portion result. The laboratory was unable to determine whether this anomaly occurred during sampling or labeling.

Attachment 1

DATA SUMMARY REPORT

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162135

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-06172-7-A1	Total	S16T021581	Ammonia	μg/sample	n/a	<10.0	1.97E+03	500
16-06172-7-A1	Front Resin	S16T021582	Ammonia	µg/sample	93.0	<10.0	1.97E+03	500
16-06172-7-A1	Back Resin	S16T021583	Ammonia	µg/sample	93.0	<10.0	<10.0	10.0
16-06172-7-A2	Total	S16T021584	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-06172-7-A2	Front Resin	S16T021585	Ammonia	µg/sample	93.0	<10.0	<10.0	10.0
16-06172-7-A2	Back Resin	S16T021586	Ammonia	µg/sample	93.0	<10.0	<10.0	10.0
16-06172-7-B1	Total	S16T021619	Ammonia	µg/sample	n/a	<10.0	120	50.0
16-06172-7-B1	Front Resin	S16T021646	Ammonia	μg/sample	93.0	<10.0	120	50.0
16-06172-7-B1	Back Resin	S16T021647	Ammonia	µg/sample	93.0	<10.0	<10.0	10.0
16-06172-7-BLANK	Total	S16T021661	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-06172-7-BLANK	Front Resin	S16T021663	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-BLANK	Back Resin	S16T021664	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-C1	Total	S16T021665	Ammonia	μg/sample	n/a	<10.0	1.05E+03	500
16-06172-7-C1	Front Resin	S16T021678	Ammonia	µg/sample	95.1	<10.0	1.05E+03	500
16-06172-7-C1	Back Resin	S16T021679	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-D1	Total	S16T021684	Ammonia	µg/sample	n/a	<10.0	174	50.0
16-06172-7-D1	Front Resin	S16T021687	Ammonia	µg/sample	95.1	<10.0	173	50.0
16-06172-7-D1	Back Resin	S16T021688	Ammonia	µg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-E1	Total	S16T021692	Ammonia	µg/sample	n/a	<10.0	1.16E+03	500
16-06172-7-E1	Front Resin	S16T021693	Ammonia	μg/sample	95.1	<10.0	1.16E+03	500
16-06172-7-E1	Back Resin	S16T021694	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-EFF-BASE	Total	S16T021698	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-06172-7-EFF-BASE	Front Resin	S16T021700	Ammonia	µg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-EFF-BASE	Back Resin	S16T021701	Ammonia	µg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-F1	Total	S16T021741	Ammonia	µg/sample	n/a	<10.0	1.35E+03	500
16-06172-7-F1	Front Resin	S16T021741	Ammonia	μg/sample	95.1	<10.0	1.35E+03	500
16-06172-7-F1	Back Resin	S16T021743	Ammonia	µg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-G1	Total	S16T021749	Ammonia	μg/sample	n/a	<10.0	297	100
16-06172-7-G1	Front Resin	S16T021754	Ammonia	μg/sample	95.1	<10.0	296	100
16-06172-7-G1	Back Resin	S16T021755	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-H1	Total	S16T021981	Ammonia	μg/sample	n/a	<10.0	1.94E+03	500
16-06172-7-H1	Front Resin	S16T021984	Ammonia	μg/sample μg/sample	95.1	<10.0	1.94E+03	500
16-06172-7-H1	Back Resin	S16T021985	Ammonia	ug/sample	95.1	<10.0	<10.0	10.0
16-06172-7-H2	Total	S16T021986	Ammonia	μg/sample	n/a	<10.0	<10.0	10.0
16-06172-7-H2	Front Resin	S16T021987	Ammonia	μg/sample μg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-H2	Back Resin	S16T021988	Ammonia	μg/sample	95.1	<10.0	<10.0	10.0
16-06172-7-IN-BASE	Total	S16T021988	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-06172-7-IN-BASE	Front Resin	S16T021992	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
16-06172-7-IN-BASE	Back Resin	S16T021993	Ammonia	μg/sample μg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-A1	Total	S16T021994 S16T022039	Ammonia	μg/sample μg/sample	n/a	<10.0	1.86E+03	200
16-06173-7-A1	Front Resin	S16T022039	Ammonia	μg/sample μg/sample	95.9	<10.0	1.86E+03	200
16-06173-7-A1	Back Resin	S16T022040	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
	Total		Ammonia				<10.0	10.0
16-06173-7-A2 16-06173-7-A2	Front Resin	S16T022046 S16T022049	Ammonia	μg/sample μg/sample	n/a 95.9	<10.0 <10.0	<10.0	10.0
					95.9	<10.0	<10.0	10.0
16-06173-7-A2	Back Resin Total	S16T022050	Ammonia	μg/sample				10.0
16-06173-7-B1		S16T022051	Ammonia	μg/sample	n/a 95.9	<10.0	<10.0	10.0
16-06173-7-B1	Front Resin	S16T022054	Ammonia	μg/sample		<10.0	<10.0	
16-06173-7-B1	Back Resin	S16T022056	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162135

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-06173-7-BLANK	Total	S16T022087	Ammonia	μg/sample	n/a	<10.0	<10.0	10.0
16-06173-7-BLANK	Front Resin	S16T022089	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-BLANK	Back Resin	S16T022090	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-C1	Total	S16T022091	Ammonia	μg/sample	n/a	<10.0	<10.0	10.0
16-06173-7-C1	Front Resin	S16T022092	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-C1	Back Resin	S16T022093	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-D1	Total	S16T022102	Ammonia	μg/sample	n/a	<10.0	30.6	10.0
16-06173-7-D1	Front Resin	S16T022105	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-D1	Back Resin	S16T022106	Ammonia	µg/sample	95.9	<10.0	29.7	10.0
16-06173-7-E1	Total	S16T022107	Ammonia	µg/sample	n/a	<10.0	52.7	10.0
16-06173-7-E1	Front Resin	S16T022108	Ammonia	µg/sample	95.9	<10.0	52.1	10.0
16-06173-7-E1	Back Resin	S16T022109	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-EFF-BASE	Total	S16T022112	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-06173-7-EFF-BASE	Front Resin	S16T022113	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-EFF-BASE	Back Resin	S16T022114	Ammonia	µg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-F1	Total	S16T022143	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-06173-7-F1	Front Resin	S16T022144	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-F1	Back Resin	S16T022145	Ammonia	μg/sample	95.9	<10.0	<10.0	10.0
16-06173-7-G1	Total	S16T022146	Ammonia	µg/sample	n/a	<10.0	1.25E+03	200
16-06173-7-G1	Front Resin	S16T022147	Ammonia	μg/sample	95.3	<10.0	1.25E+03	200
16-06173-7-G1	Back Resin	S16T022148	Ammonia	µg/sample	95.3	<10.0	<10.0	10.0
16-06173-7-H1	Total	S16T022149	Ammonia	µg/sample	n/a	<10.0	771	200
16-06173-7-H1	Front Resin	S16T022151	Ammonia	μg/sample	95.3	<10.0	770	200
16-06173-7-H1	Back Resin	S16T022152	Ammonia	µg/sample	95.3	<10.0	<10.0	10.0
16-06173-7-H2	Total	S16T022156	Ammonia	µg/sample	n/a	<10.0	82.4	10.0
16-06173-7-H2	Front Resin	S16T022159	Ammonia	μg/sample	95.3	<10.0	81.6	10.0
16-06173-7-H2	Back Resin	S16T022160	Ammonia	μg/sample	95.3	<10.0	<10.0	10.0
16-06173-7-IN-BASE	Total	S16T022161	Ammonia	µg/sample	n/a	<10.0	12.7	10.0
16-06173-7-IN-BASE	Front Resin	S16T022162	Ammonia	µg/sample	95.3	<10.0	12.0	10.0
16-06173-7-IN-BASE	Back Resin	S16T022163	Ammonia	µg/sample	95.3	<10.0	<10.0	10.0

Attachment 2

ANALYSIS DATE REPORT

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162135

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T021582	16-06172-7-A1	Ammonia	08/03/2016 08:00	08/04/2016 11:37
S16T021583	16-06172-7-A1	Ammonia	08/03/2016 08:00	08/03/2016 22:58
S16T021585	16-06172-7-A2	Ammonia	08/03/2016 08:00	08/04/2016 00:05
S16T021586	16-06172-7-A2	Ammonia	08/03/2016 08:00	08/04/2016 00:22
S16T021646	16-06172-7-B1	Ammonia	08/03/2016 08:00	08/04/2016 11:54
S16T021647	16-06172-7-B1	Ammonia	08/03/2016 08:00	08/04/2016 00:56
S16T021663	16-06172-7-BLANK	Ammonia	08/03/2016 08:00	08/04/2016 03:11
S16T021664	16-06172-7-BLANK	Ammonia	08/03/2016 08:00	08/04/2016 03:28
S16T021678	16-06172-7-C1	Ammonia	08/03/2016 08:00	08/04/2016 13:02
S16T021679	16-06172-7-C1	Ammonia	08/03/2016 08:00	08/04/2016 04:01
S16T021687	16-06172-7-D1	Ammonia	08/03/2016 08:00	08/04/2016 13:19
S16T021688	16-06172-7-D1	Ammonia	08/03/2016 08:00	08/04/2016 04:35
S16T021693	16-06172-7-E1	Ammonia	08/03/2016 08:00	08/04/2016 13:35
S16T021694	16-06172-7-E1	Ammonia	08/03/2016 08:00	08/04/2016 06:00
S16T021700	16-06172-7-EFF-BASE	Ammonia	08/03/2016 08:00	08/04/2016 06:17
S16T021701	16-06172-7-EFF-BASE	Ammonia	08/03/2016 08:00	08/04/2016 06:33
S16T021742	16-06172-7-F1	Ammonia	08/03/2016 08:00	08/04/2016 13:52
S16T021743	16-06172-7-F1	Ammonia	08/03/2016 08:00	08/04/2016 07:07
S16T021754	16-06172-7-G1	Ammonia	08/03/2016 08:00	08/04/2016 14:09
S16T021755	16-06172-7-G1	Ammonia	08/03/2016 08:00	08/04/2016 07:41
S16T021984	16-06172-7-H1	Ammonia	08/03/2016 08:00	08/04/2016 14:26
S16T021985	16-06172-7-H1	Ammonia	08/03/2016 08:00	08/04/2016 08:15
S16T021987	16-06172-7-H2	Ammonia	08/03/2016 08:00	08/04/2016 09:39
S16T021988	16-06172-7-H2	Ammonia	08/03/2016 08:00	08/04/2016 09:56
S16T021993	16-06172-7-IN-BASE	Ammonia	08/04/2016 08:00	08/04/2016 18:39
S16T021994	16-06172-7-IN-BASE	Ammonia	08/04/2016 08:00	08/04/2016 19:02
S16T022040	16-06173-7-A1	Ammonia	08/04/2016 08:00	08/05/2016 16:38
S16T022041	16-06173-7-A1	Ammonia	08/04/2016 08:00	08/04/2016 19:48
S16T022049	16-06173-7-A2	Ammonia	08/04/2016 08:00	08/04/2016 20:11
S16T022050	16-06173-7-A2	Ammonia	08/04/2016 08:00	08/04/2016 20:35
S16T022054	16-06173-7-B1	Ammonia	08/04/2016 08:00	08/04/2016 22:07
S16T022056	16-06173-7-B1	Ammonia	08/04/2016 08:00	08/04/2016 22:30
S16T022089	16-06173-7-BLANK	Ammonia	08/04/2016 08:00	08/04/2016 22:53
S16T022090	16-06173-7-BLANK	Ammonia	08/04/2016 08:00	08/04/2016 23:17
S16T022092	16-06173-7-C1	Ammonia	08/04/2016 08:00	08/04/2016 23:40
S16T022093	16-06173-7-C1	Ammonia	08/04/2016 08:00	08/05/2016 00:03
S16T022105	16-06173-7-D1	Ammonia	08/04/2016 08:00	08/05/2016 00:26
S16T022106	16-06173-7-D1	Ammonia	08/04/2016 08:00	08/05/2016 00:49
S16T022108	16-06173-7-E1	Ammonia	08/04/2016 08:00	08/05/2016 01:12
S16T022109	16-06173-7-E1	Ammonia	08/04/2016 08:00	08/05/2016 01:35
S16T022113	16-06173-7-EFF-BASE	Ammonia	08/04/2016 08:00	08/05/2016 03:08
S16T022114	16-06173-7-EFF-BASE	Ammonia	08/04/2016 08:00	08/05/2016 03:31
S16T022144	16-06173-7-F1	Ammonia	08/04/2016 08:00	08/05/2016 03:54
S16T022145	16-06173-7-F1	Ammonia	08/04/2016 08:00	08/05/2016 04:18
S16T022147	16-06173-7-G1	Ammonia	08/04/2016 08:00	08/05/2016 17:24
S16T022148	16-06173-7-G1	Ammonia	08/04/2016 08:00	08/05/2016 07:46

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162135

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T022151	16-06173-7-H1	Ammonia	08/04/2016 08:00	08/05/2016 17:01
S16T022152	16-06173-7-H1	Ammonia	08/04/2016 08:00	08/05/2016 08:32
S16T022159	16-06173-7-H2	Ammonia	08/04/2016 08:00	08/05/2016 08:55
S16T022160	16-06173-7-H2	Ammonia	08/04/2016 08:00	08/05/2016 09:18
S16T022162	16-06173-7-IN-BASE	Ammonia	08/04/2016 08:00	08/05/2016 10:51
S16T022163	16-06173-7-IN-BASE	Ammonia	08/04/2016 08:00	08/05/2016 11:14

Attachment 3

RECEIPT PAPERWORK

Date Samples Rece	ived: 7-25-11		otal N	Jumbo	er of Samples: 312 Gr	oup #: _20162135-
	TERESA FRAZ			, annue	IH Technician:	1 Asm
		_		Custo	odian to Complete:	I gu
Ac	ction	Yes	No	N/A		Comments
RSR provided?			200	7		
Verify GKI is complete				7	☐ In Project File	
Received from an alph	a facility?		7	樓	Contact PC for approval	to release
Check that outer custo	dy seal is intact, if			7		
Record cooler tempera appropriate	ture in centigrade, as	4.0			Check if no cooler and/or	no ice
Samples are intact and	in good condition	7			If No, provide comments below	W
RSA/COC provided and the following informatio	d complete containing n?			¥.		
Client name and	d client sample number	7				THE PERSON NAMED IN THE REST. OF THE PERSON
Date and time or	f sampling	7				
Sampling location	on or origin	7				
Container type,	size, and number	7				
 Preservatives (if COC/RSA and s 	used) noted on the sample bottles	,	-	7		
 Analysis reques 	t is clear	7				
 Signature of per receiving sample 	sons relinquishing and	7				
 Date and/or time exchange 	of sample custody	7		<u>.</u>		
Verify that sample number match the COC and/or I	pers on containers RSA	7			1	
Samples stored properly	y (e.g., refrigeration)	7				
Notify the PC immedi he initials block below	ately if any problems w is completed by the	are no	ted.	Any "N	No" checked boxes require F	PC resolution. For WRPS sample
I No. comment on co	es Received:	olution	1,	C Initia	cust s	1-25-16 425/16
Aldehyde Screen: 2 Beryllium:		UB		mmonia	-	
				e-Filte	D- 141	1,3-Butadiene: 52

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

CACN: 202	367202003 COA	: CB20	Survey No.	: 16-06172 -		ampled: (Cartridge Te				
Contact Name:			(509)373-4966		urnarou		sting A Far			
Return Report	To: Caldwell, Joyce A		**************************************	MSIN: R1						
Laboratory	Sample ID/Type/Desc	ription		mont. K		Phone: (
Log No.					Re	quired Ana	lysis			
	16-06172-6-H1 / Hydr				Hg	-Elemental	CM			
		A BO MILE ELEVATION					7-8			
	16-06172-6-H2 / Hydr	ar (SKC 226-17-1A)			Ha-	-Elemental				
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	16-06172-6-IN-BASE	The state of the s	'-1A)		-					
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1584	16-06172-7-A2 / CISA	(SKC 226-29) SI	6T 021 58	5	NH3	3				
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19	16-06172-7-B1 / CISA		16T 021 6		NH3					
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1021665	1		S16 T 021		NH3					
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INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

CACN: 202		202003	OA: C	B20		Survey	/ No.:	16-0617	2 - Resp	irator	Cartridge	Test	ting A Farm
Contact Name:	Dr. Contract of Edition	7/25/16 arker L			Phone:	(509)373-496	36		Turna	roui	nd: N/A	ā;	
Return Report	To: Cald	well, Joyce A					1	MSIN:	R1-06		Phone	: (5	09)376-073
Laboratory Log No.	Samp	le ID/Type/	Descript	tion						Red	juired A		
11684	16-06	172-7-D1 /	CISA (S	KC 226	-29) 5	16 T 021	(87		-	NH3	3	- 122	
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J02 (981	THE BLOOM	mm marin		HHHH		5167	0219	85		,			
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INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

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CACN: 202367	202003	COA: CB	20	Sui	vev No.	: 16-0617	73 - Respira	Sample		
Contact Name:	Jones, Parker L	(ric	Pho	one: (509)373	4966	10-0017				ting A Fan
Return Report To	o: Caldwell, Joy	e A	1000	(000)0/0	4300	MSIN:		ound: N	00/50/1	5.4000000
Laboratory					-	IVISIN:	R1-06	Phor	ne: (5	09)376-07
Log No.	Sample ID/Ty	·						Required	Anal	ysis
	16-06173-6-H	1 / Hydrar (S	KC 226-17	-1A)				Hg-Elem	ental	
	MARKETT	ALAM MARTHAM	WWA							
	16-06173-6-H	2 / Hydrar-(SI	KC 226-17-	1A)				-lg-Eleme	ntal	
								ig-Eleme	entai	
	16-06173-6-IN	-BASE / Hvd	rar (SKC 2	26-17-1A)				1		
							_	lg-Eleme	ental	
				MUNICIPAL						
1022039	16-06173-7-A1			S16 TO2.	2040		N	IH3		
				SIGTOZ:	1041					
046	16-06173-7-A2	/ CISA (SKC	226-29)	,S16T	02200	19	N	НЗ		
167022046		MARAKAN MARK	HHH		220					
	16-06173-7-B1 / CISA (SKC 226-29) SIL TO 22 054						N	NH3		
	567022056						1000	N1950		
-047	16-06173-7-BL	ANK / CISA (SKC 226-2	9) 5167	2208	34	NI	NH3		
167022047		ALIO MARKAT AN ALIO A					1.5	10		
91	16-06173-7-C1 / CISA (SKC 226-29) SI 6-7022092 NH3									
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ecial Instructions:			2000							
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	Signatu	ire	0	Printed N	ame		Da	ate		Time
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inquished By:		()			_		1/25	1160	111	100
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inquished By:								7.2-	_	
ceived By:							T-1			- // -
litional Comments										

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST



	ashington River Prot				100	Date	Sampled:	07/23/2016
CACN: 202367		COA: CB2	0	Survey N	No.: 16-06173		or Cartridge 1	
	Jones, Parker L		Phone: (5	09)373-4966			und: N/A	
	To: Caldwell, Joyc	e A			MSIN:	R1-06	Phone:	(509)376-07
Laboratory Log No.	Sample ID/Ty	pe/Description				R	equired Ana	
367022102	16-06173-7-D	1 / CISA (SKC	226-29) 516	70221	05		H3	
x610	(A) DE LE SERVICION DE LA COMPANSION DE		1111 'S	J0221	06			
167022107	16-06173-7-E		-	6702	2108	N	13	
16 '			regression	16702	2 109			
67022112	Western otter mediatrocki		SA (SKC 226-29)	•	022113	NE	13	
.6 '				SIGT	022 114			
(10221M)	16-06173-7-F1			51670	022144	NH	13	
ν,					22/45			
,7022146	16-06173-7-G1		500 A 100	S167	022147	NH	3	
, , ,				S167	022148			
7022149	16-06173-7-H1			Sl6 7	022151	NH	3	
0'			ACCOUNT OF THE PARTY OF THE PAR	5167	022152	-		
7022156	16-06173-7-H2			51670	22 159	NH:	3	
, ,			A CONTRACTOR OF THE CONTRACTOR	51670	02/160			
7022161	16-06173-7-IN-E			, 516	TOUZI	A NHS	3	
, 10			HARMAN AND AND AND	$\leq l$	6700216	3		
ecial Instructions	51							-
		nature	Printed Na	me	Locatio	n	Date	Time
ivered to Storag	- James	Sug	Gerralo Sa	ine 2	704 40/1	4 104	7-23-1	6 2359
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Aldehydes C.3.8



ANALYTICAL REPORT

Report Date: August 03, 2016

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov 20162150

Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Robert (Buddy) Sosa Washington River Protection So PO Box 850, MSIN T6-02 Richland, WA 99352

Analytical Results				
Sample ID: S16T021901				Collected: 07/22/2016
Lab ID: 1620930001				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel (2 trophenylhydrazine) Volume Not Provided	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.39	NA	NA	0.050
Acetaldehyde	2.3	NA	NA	0.050
Acetone	13	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.98	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.81	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	< 0.050	NA	NA	0.050
Valeraldehyde	0.095	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	0.31	NA	NA	0.050
2.5-Dimethylbenzaldehyde	< 0.050	NA	NA	0.050

Sample ID: S16T021902				Collected: 07/22/2016	
Lab ID: 1620930002				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Formaldehyde	0.10	NA	NA	0.050	
Acetaldehyde	1.1	NA	NA	0.050	

Results Continued on Next Page

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

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IHREP-V12.3

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ANALYTICAL REPORT

Workorder: 34-1620930

Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results				
Sample ID: S16T021902				Collected: 07/22/2016
Lab ID: 1620930002				Received: 07/27/2016
Method: EPA TO-11A	San	(2,4- Analyzed: 07/28/2016 d		
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
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: S16T021903				Collected: 07/22/2016		
Lab ID: 1620930003				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)		
Formaldehyde	0.082	NA	NA	0.050		
Acetaldehyde	1.3	NA	NA	0.050		
Acetone	0.28	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		

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results					
Sample ID: S16T021904				Collected: 07/22/2016	
Lab ID: 1620930004				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)	
Formaldehyde	<0.050	NA	NA	0.050	
Acetaldehyde	<0.050	NA	NA	0.050	
Acetone	0.59	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: S16T021905				Collected: 07/22/2016	
Lab ID: 1620930005				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)	
Formaldehyde	<0.050	NA	NA	0.050	
Acetaldehyde	1.2	NA	NA	0.050	
Acetone	2.4	NA	NA	0.050	
Acrolein	<0.050	NA	NA	0.050	
Propionaldehyde	0.063	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	

Results Continued on Next Page

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021905					Collected: 07/22/2016
Lab ID: 1620930005					Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	Difference of the Control of the Con	Analyzed: 07/28/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	sample)
Hexanal	<0.050	NA	NA		0.050
2.5-Dimethylbenzaldehyde	<0.050	NA	NA		0.050

Sample ID: S16T021906				Collected: 07/22/2016	
Lab ID: 1620930006				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/201 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Formaldehyde	0.053	NA	NA	0.050	
Acetaldehyde	1.3	NA	NA	0.050	
Acetone	3.2	NA	NA	0.050	
Acrolein	<0.050	NA	NA	0.050	
Propionaldehyde	0.088	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: \$16T021907 Lab ID: 1620930007				Collected: 07/22/2016 Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	1.1	NA	NA	0.050
Acetone	6.2	NA	NA	0.050

Results Continued on Next Page

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results				
Sample ID: S16T021907				Collected: 07/22/2016
Lab ID: 1620930007				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel (itrophenylhydrazine) Volume Not Provided	
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	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: S16T021908				Collected: 07/22/2016	
Lab ID: 1620930008				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)		RL (ug/sample)	
Formaldehyde	0.070	NA	NA	0.050	
Acetaldehyde	0.082	NA	NA	0.050	
Acetone	0.25	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	

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Allalytical Results					
Sample ID: S16T021909				Collected: 07/22/2016	
Lab ID: 1620930009				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)	
Formaldehyde	<0.050	NA	NA	0.050	
Acetaldehyde	0.98	NA	NA	0.050	
Acetone	8.9	NA	NA	0.050	
Acrolein	<0.050	NA	NA	0.050	
Propionaldehyde	0.17	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: S16T021910				Collected: 07/22/2016	
Lab ID: 1620930010				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Formaldehyde	<0.050	NA	NA	0.050	
Acetaldehyde	1.2	NA	NA	0.050	
Acetone	7.5	NA	NA	0.050	
Acrolein	<0.050	NA	NA	0.050	
Propionaldehyde	0.15	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	

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Lab ID: 1620930010 Method: EPA TO-11A			226-119, Silica Ge trophenylhydrazine)	I (2,4- Analyzed:	07/27/2016 07/28/2016
		npling Parameter: Air			
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)	
Hexanal	<0.050	NA	NA	0.050	
		NA	NA	0.050	

Sample ID: S16T021911				Collected: 07/22/2016	
Lab ID: 1620930011				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Formaldehyde	0.14	NA	NA	0.050	
Acetaldehyde	2.1	NA	NA	0.050	
Acetone	13	NA	NA	0.050	
Acrolein	<0.050	NA	NA	0.050	
Propionaldehyde	1.0	NA	NA	0.050	
Crotonaldehyde	<0.050	NA	NA	0.050	
Butyraldehyde	0.79	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: \$16T021912 Lab ID: 1620930012				Collected: 07/22/2016 Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	1.2	NA	NA	0.050
Acetone	7.0	NA	NA	0.050

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results						
Sample ID: S16T021912				Collected: 07/22/2016		
Lab ID: 1620930012				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/20 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)		
Acrolein	<0.050	NA	NA	0.050		
Propionaldehyde	0.16	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: S16T021913				Collected: 07/22/2016		
Lab ID: 1620930013				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/28/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	RL (ug/sample)				
Formaldehyde	0.25	NA	NA	0.050		
Acetaldehyde	0.091	NA	NA	0.050		
Acetone	0.29	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	0.16	NA	NA	0.050		
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050		

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Workorder: 34-1620930

Client Project ID: Washington River Protection So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results						
Sample ID: S16T021914				Collected: 07/23/2016		
Lab ID: 1620930014				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	RL (ug/sample)					
Formaldehyde	0.44	NA	NA	0.050		
Acetaldehyde	1.9	NA	NA	0.050		
Acetone	4.8	NA	NA	0.050		
Acrolein	<0.050	NA	NA	0.050		
Propionaldehyde	0.81	NA	NA	0.050		
Crotonaldehyde	<0.050	NA	NA	0.050		
Butyraldehyde	0.68	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: \$16T021915				Collected: 07/23/2016		
Lab ID: 1620930015				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)		
Formaldehyde	0.17	NA	NA	0.050		
Acetaldehyde	1.1	NA	NA	0.050		
Acetone	0.076	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		

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So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021915					Collected: 07/23/2016
Lab ID: 1620930015					Received: 07/27/2016
Method: EPA TO-11A Media: SKC 226-119, Sili Dinitrophenylhydr. Sampling Parameter: Air Volume Not P				articles and the second	Analyzed: 07/29/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	sample)
Hexanal	<0.050	NA	NA		0.050
2.5-Dimethylbenzaldehyde	<0.050	NA	NA		0.050

Sample ID: S16T021916 Lab ID: 1620930016				Collected: 07/23/2016 Received: 07/27/2016
Method: EPA TO-11A	San	(2,4- Analyzed: 07/29/2016		
Analyte	Result (ug/sample)	RL (ug/sample)		
Formaldehyde	0.089	NA	NA	0.050
Acetaldehyde	1.1	NA	NA	0.050
Acetone	2.0	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.079	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: \$16T021917 Lab ID: 1620930017				Collected: 07/23/2016 Received: 07/27/2016
Method: EPA TO-11A	San	I (2,4- Analyzed: 07/29/2016 ed		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.43	NA	NA	0.050

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Analytical Results

Sample ID: S16T021917				Collected: 07/23/2016		
Lab ID: 1620930017				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)		
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: S16T021918				Collected: 07/23/2016	
Lab ID: 1620930018				Received: 07/27/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Result				RL (ug/sample)	
Formaldehyde	<0.050	NA	NA	0.050	
Acetaldehyde	0.96	NA	NA	0.050	
Acetone	4.1	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	

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Analytical Results

Paralytroal Rosaits						
Sample ID: S16T021919				Collected: 07/23/2016		
Lab ID: 1620930019				Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)		
Formaldehyde	< 0.050	NA	NA	0.050		
Acetaldehyde	1.0	NA	NA	0.050		
Acetone	4.9	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: \$16T021920 Lab ID: 1620930020				Collected: 07/23/2016 Received: 07/27/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/201 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	1940 Maria 1840 P	RL (ug/sample)		
Formaldehyde	< 0.050	NA	NA	0.050		
Acetaldehyde	1.2	NA	NA	0.050		
Acetone	4.1	NA	NA	0.050		
Acrolein	<0.050	NA	NA	0.050		
Propionaldehyde	0.085	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		

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Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021920					Collected: 07/23/2016
Lab ID: 1620930020					Received: 07/27/2016
Method: EPA TO-11A	A TO-11A Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				Analyzed: 07/29/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	ample)
Hexanal	<0.050	NA	NA		0.050
2.5-Dimethylbenzaldehyde	<0.050	NA	NA		0.050

Sample ID: S16T021921				Collected: 07/23/2016
Lab ID: 1620930021				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel irophenylhydrazine) folume Not Provide	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	0.074	NA	NA	0.050
Acetone	0.33	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: \$16T021922 Lab ID: 1620930022				Collected: 07/23/2016 Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	1.1	NA	NA	0.050
Acetone	3.7	NA	NA	0.050

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Workorder: 34-1620930

Client Project ID: Washington River Protection So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results				
Sample ID: S16T021922				Collected: 07/23/2016
Lab ID: 1620930022				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel (trophenylhydrazine) Volume Not Provided	
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.083	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: S16T021923				Collected: 07/23/2016
Lab ID: 1620930023				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel (trophenylhydrazine) Volume Not Provided	
Analyte	Result (ug/sample)	Result (mg/m³)		RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	1.1	NA	NA	0.050
Acetone	6.8	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	< 0.050	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

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Workorder: 34-1620930

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Analytical Results

Analytical Results				
Sample ID: S16T021924				Collected: 07/23/2016
Lab ID: 1620930024				Received: 07/27/2016
Method: EPA TO-11A	Sar		226-119, Silica Gel trophenylhydrazine) Volume Not Provide	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.21	NA	NA	0.050
Acetaldehyde	2.0	NA	NA	0.050
Acetone	14	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.89	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.72	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: S16T021925				Collected: 07/23/2016
Lab ID: 1620930025				Received: 07/27/2016
Method: EPA TO-11A	San		226-119, Silica Gel (trophenylhydrazine) folume Not Provided	
Analyte	Result (ug/sample)	Result (mg/m³)	2000 March 1000 C	RL (ug/sample)
Formaldehyde	< 0.050	NA	NA	0.050
Acetaldehyde	1.2	NA	NA	0.050
Acetone	8.7	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	<0.050	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

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Workorder: 34-1620930

Client Project ID: Washington River Protection

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Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T021925 Collected: 07/23/2016 Lab ID: 1620930025 Received: 07/27/2016 Method: EPA TO-11A Media: SKC 226-119, Silica Gel (2,4-Analyzed: 07/29/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided Result Analyte (ug/sample) Result (mg/m³) Result (ppm) RL (ug/sample) Hexanal <0.050 NA NA 0.050 2,5-Dimethylbenzaldehyde < 0.050 NA NA 0.050

Sample ID: \$16T021926 Collected: 07/23/2016 Lab ID: 1620930026 Received: 07/27/2016

Method: EPA TO-11A Media: SKC 226-119, Silica Gel (2,4- Analyzed: 07/29/2016

Dinitrophenylhydrazine)

Sampling Parameter: Air Volume Not Provided Result Analyte (ug/sample) Result (mg/m³) Result (ppm) RL (ug/sample) Form aldehyde 0.31 NA NA 0.050 NA NA 0.050 Acetaldehyde 0.12 Acetone 0.45 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 NA < 0.050 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

Comments

Quality Control: EPA TO-11A - (HBN: 173721)

LMB used to media correct LCS/LCSD and field samples for Acetone only.

Quality Control: EPA TO-11A - (HBN: 173791)

LMB used to media correct LCS/LCSD and field samples for Acetone only.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ David Teynor	/S/ Christopher Winter	
08/02/2016 15:53	08/03/2016 10:00	
	/S/ David Teynor	/S/ David Teynor /S/ Christopher Winter

Page 16 of 18 Wed, 08/03/16 10:10 AM IHREP-V12.3

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Workorder: 34-1620930

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	
EDA TO 444	/S/ David Teynor	/S/ Lyle Edwards	
EPA TO-11A	08/02/2016 17:05	08/03/2016 08:31	

Laboratory Contact Information

ALS Environmental Phone: (801) 266-7700
960 W Levoy Drive Email: alslt.lab@ALSGlobal.com
Salt Lake City, Utah 84123 Web: www.alsslc.com

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.

This test report shall not be reproduced, except in tail, million approval of ALO.

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	ACLASS (DoD ELAP)	ADE-1420	http://www.aclasscorp.com
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	1A# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/qa/
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
Industrial Hygiene	AIHA-LAP, LLC (ISO 17025 and AIHA-LAP, LLC IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	http://www.aclasscorp.com
Soil, Dust, Paint ,Air	AIHA-LAP, LLC (ISO 17025, AIHA-LAP, LLC ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.com



Workorder: 34-1620930

Client Project ID: Washington River Protection

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Purchase Order: 55502 Rel9 Project Manager: Rand Potter

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 Envrionmental 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



Analysis Information

Workorder: 1620930

Limits: Historical/Performance Preparation: NA Basis: ALS Laboratory Group Batch: NA

Prepared By: NA Analyzed By: David Teynor

Analysis: EPA TO-11A

Batch: ILC/12388 (HBN: 173721)

LMB: 510378 Analyzed: 07/28/2016 00:00

Units: ug/sample

Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.328	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: 510379 LCSD: 510380 Analyzed: 07/28/2016 00:00 Analyzed: 07/28/2016 00:00

Dilution: 1 Units: ug/sample						Dilution: 1 Units: ug	/sample			
Analyte	Result	Target	% Rec	QCL	imits	Result	% Rec	RPD	QC LI	mits
Formaldehyde	3.09	3.00	103	87.8	116.8	3.02	101	2.29	0.0	20.0
Acetaldehyde	3.06	3.00	102	94.7	110.5	3.03	101	0.985	0.0	20.0
Acetone	2.67	3.00	89.1	69.2	119.9	2.64	88.1	1.13	0.0	20.0
Acrolein	2.91	3.00	97.0	83.5	120.2	2.92	97.3	0.343	0.0	20.0
Propionaldehyde	3.16	3.00	105	92.2	117.2	3.15	105	0.317	0.0	20.0
Crotonaldehyde	3.05	3.00	102	93.1	114.8	3.02	101	0.988	0.0	20.0
Butyraldehyde	3.05	3.00	102	86.6	120.8	3.05	102	0.00	0.0	20.0
Benzaldehyde	3.06	3.00	102	96.0	112.3	3.07	102	0.326	0.0	20.0
Isovaleraldehyde	3,10	3.00	103	95.4	121.6	3.10	103	0.00	0.0	20.0
Valeraldehyde	3.06	3.00	102	85.3	120.4	3.06	102	0.00	0.0	20.0
m-Tolualdehyde	3.22	3.00	107	80.9	118.6	3.09	103	4.12	0.0	20.0
p-Tolualdehyde	2.76	3.00	92.0	83.5	122.2	2.83	94.3	2.50	0.0	20.0
o-Tolualdehyde	2.92	3.00	97.3	91.6	111.4	2.91	97.0	0.343	0.0	20.0
Hexanal	3.28	3.00	109	85.4	127.6	3.06	102	6.94	0.0	20.0
2,5-Dimethylbenzaldehyde	3.23	3:00	108	99.6	118.7	3.21	107	0.621	0.0	20.0

Page 1 of 4 Wednesday, August 03, 2016 QCS V4.1



Analysis Information

Workorder: 1620930

Limits: Historical/Performance Preparation: NA Analysis: EPA TO-11A

Basis: ALS Laboratory Group Batch: NA Batch: ILC/12388 (HBN: 173721)

Prepared By: NA Analyzed By: David Teynor

Comments

LMB used to media correct LCS/LCSD and field samples for Acetone only.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ David Teynor	/S/ Christopher Winter	
08/02/2016 15:53	08/03/2016 10:00	

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits

RPD - Relative % Difference (Spike / Spike Duplicate)

▲ - Sample result is greater than 4 times the spike added

ND - Not Detected (U - Qualifier also flags analyte as not detected)

Sample and Matrix Duplicate less than 5 times the reporting limit

NA - Not Applicable

. Result is above the calibration range

QC results are not adjusted for moisture correction, where applicable



Analysis Information

Workorder: 1620930

Limits: Historical/Performance Preparation: NA Basis: ALS Laboratory Group Batch: NA Prepared By: NA

Analyzed By: David Teynor

Analysis: EPA TO-11A

Batch: ILC/12393 (HBN: 173791)

LMB: 510613 Analyzed: 07/29/2016 00:00

Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.222	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: 510614 LCSD: 510615 Analyzed: 07/29/2016 00:00 Analyzed: 07/29/2016 00:00 Dilution: 1 Dilution: 1

Units: ug/sample						Units: ug	/sample			
Analyte	Result	Target	%Rec	QCL	imits	Result	%Rec	RPD	QC LI	mits
Formaldehyde	3.03	3.00	101	87.8	116.8	3.09	103	1.96	0.0	20.0
Acetaldehyde	3.05	3.00	102	94.7	110.5	3.07	102	0.654	0.0	20.0
Acetone	2.84	3.00	94.6	69.2	119.9	2.86	95.3	0.702	0.0	20.0
Acrolein	2.92	3.00	97.3	83.5	120.2	2.96	98.7	1.36	0.0	20.0
Propionaldehyde	3.14	3.00	105	92.2	117.2	3.19	106	1.58	0.0	20.0
Crotonaldehyde	2.99	3.00	99.7	93.1	114.8	3,00	100	0.334	0.0	20.0
Butyraldehyde	3,12	3.00	104	86.6	120.8	3.12	104	0.00	0.0	20.0
Benzaldehyde	3.06	3.00	102	96.0	112.3	3.12	104	1.94	0.0	20.0
Isovaleraldehyde	3,18	3.00	106	95.4	121.6	3.20	107	0.627	0.0	20.0
Valeraldehyde	3,12	3.00	104	85.3	120.4	3.09	103	0.966	0.0	20.0
m-Tolualdehyde	3.04	3.00	101	80.9	118.6	3.11	104	2.28	0.0	20.0
p-Tolualdehyde	2.88	3.00	96.0	83.5	122.2	2.88	96.0	0.00	0.0	20.0
o-Tolualdehyde	3.02	3.00	101	91.6	111.4	2.98	99.3	1.33	0.0	20.0
Hexanal	3.26	3.00	109	85.4	127.6	3,33	111	2.12	0.0	20.0
2,5-Dimethylbenzaldehyde	3.25	3.00	108	99.6	118.7	3.28	109	0.919	0.0	20.0

Page 3 of 4 Wednesday, August 03, 2016 QCS V4.1



Analysis Information

Workorder: 1620930

Limits: Historical/Performance Preparation: NA Analysis: EPA TO-11A

Batch: NA Batch: ILC/12393 (HBN: 173791) Basis: ALS Laboratory Group

Prepared By: NA Analyzed By: David Teynor

LMB used to media correct LCS/LCSD and field samples for Acetone only.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ David Teynor	/S/ Lyle Edwards	
08/02/2016 17:05	08/03/2016 08:31	

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

1 1 3 1 2 1			n.		CHAI	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	20162150	150
To (Lab)					V.			Page 1	of 3
the E EVALUATION TO (Lab)					Contact/Requestor		201	MSIN FAX 372-1878	2-1878
To (Lab)					Sample Origin CARTRIDGE EVALUATION	MOII	Purchase Order/Charge Code 202003/CB20		
To (Lab)					Logbook/ Work Package No.	ckage No.	Ice Chest No. 4/75 - 0/3	Temp. ON	ON ICE
1					Method of Shipment		Bill of Lading/Air Bill No. 7	8844 8962	5256
L					Data Turnaround		Parts and Return No. 4/1	12014	e
Salliple No.	Lab ID		Date	Time	No./Type Container	Sample	Sample Analysis		Preservative
S16T(S16T021901	V.	7/22/16		SILICA GEL	Aldehyde 16-06172-8-Al /			25C or low
\$167(\$167021902	V.	7/22/16		SILICA GEL	Aldehyde 16-06172-8-A2 !			25C or low
SIGT	S16T021903	8	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-81 9			25C or low
SIGT	S16T021904	VA	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-BLANK /			25C or low
SIGT	\$167021905	K.	7/22/16		SILICA GEL	Aldehyde 16-06172-8-C1 4			25C or low
S16T(\$16T021906	V.	7/22/16		SILICA GEL	Aldehyde 16-06172-8-D1 v		- 777	25C or low
S16T(S16T021907	V.	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-E1 ^	• 100		25C or low
81620	8167021908	V.	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-EFF-BASE;			25C or low
8161	S16T021909	V.	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-F1 }			25C or low
SIGT	S16T021910	V.	VA 7/22/16		SILICA GEL	Aldehyde 16-06172-8-G1			25C or low
POSSIBLE SAMPLE H	HAZARDS/F	EMAR	RKS (List all k	nown wast	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes EPA TO-11A	SPECIAL INSTRUCTIONS Sand Results to Carl Howald IV and Greg Moore Carl W Howalder, gov and Gregory S_Mooreërl.gov and Gregory S_Mooreërl.gov and Release 9 Release 9 Nose Contract # 55502 Nose 2016, Moo	i IV and Greg SOW for email	Hold Time	
Shaward By	Print	7	Sign Phi Uhilu	7.26	7-26-16 09-00 S	Hardey Sign	Date/Time S 24-16/0500 S	Matrix*	= Drum Liquids
Relinquished By SW Harder WRPS	Harder PS	14.8		7-26-16		Y FELEX	Date/Time SE SO	= Sediment T = Solid WI	= Tissue = Wipe = Liquid
Relinquished By		-	adup			and any based anil on assell	Or Sterrime W	> ≸ >	= Vegetation = Vapor
Relinquished By					Date/Time Rece	Received By (Date/Time of DS =		iano i
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., R	Return to cust	omer, per l	nod (e.g., Return to customer, per lab procedure, Used in process)	CONSUMP Disposed By		07/28/16	13.00

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Contactive Con	W/W					CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		20162150 Page 2 of	of 3
Sample Organic Conference C	Collector					Contact/Request	00		MSIN FAX 3	372-1878
Substitution Supplied Verif Package No. Got Chest No. Loc Chest No.	SAF No.					Sample Origin CARTRIDGE EVAL	NOIDE			
Date Three NoTifice California Date Three Date Three	Project Title	CUATION				Logbook/ Work F	ackage No.	ice Chest No. 1UTS - 013	Temp. OD	# CE
10 Gate Turner 10 G	Shipped To (La	(qı				Method of Shipm	ent	Bill of Lading/Air Bill No.	1768 443	4438 5296
Signolisis Time No.Type Container Sample Analysis	Protocol 1/a					Data Turnaround			_	
11 VA 7/22/16	Sample No.	Cab ID	٠	Date	Time	No./Type Container	Sample	e Analysis		Preservative
12 VA 7/22/16 SILICA GEL Aldehyde 16-06172-8-R2 14 VA 7/22/16 SILICA GEL Aldehyde 16-06172-8-R1 15 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-R1 16 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-R1 17 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-R1 18 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-ELMK 19 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-ELMK 19 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-ELM 19 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-EL 19 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-ELM 19 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-EL 10 VA		S16T021911	V.	7/22/16		SILICA GEL	Aldehyde 16-06172-8-H1 /			25C or low
13 VA 7/22/16 SILICA GEL Aldebyde 16-06172-8-18-18 1 14 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-11 1 15 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-22, 16 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-11 1 17 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-21 4 18 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-21 4 19 VA 7/23/16 SILICA GEL Aldebyde 16-06173-8-21 4 20 V		S16T021912	\$	7/22/16		SILICA GEL	Aldehyde 16-06172-8-H2 ,			25C or low
14		S16T021913	\$	7/22/16	*	SILICA GEL	Aldehyde 16-06172-8-IN-BASE ,		0.000	25C or low
15 17, 17, 12, 16 SILICA GEL Aldehyde 16-06173-8-11; 17 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 17 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 18 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 19 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 19 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 19 17, 17, 17, 15 SILICA GEL Aldehyde 16-06173-8-11; 19 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 16 SILICA GEL Aldehyde 16-06173-8-11; 20 17, 17, 17, 17, 17, 17, 17, 17, 17, 17,		S16T021914	5	7/23/16		SILICA GEL	Aldehyde 16-06173-8-Al 1			25C or 10W
15 17,23/16 SILICA GEL Aldehyde 16-06173-9-BIANK /		S16T021915	×		/1	SILICA GEL	Aldehyde 16-06173-8-A2,			25C or low
17		\$161021916	X.			SILICA GEL	Aldehyde 16-06173-8-51;			25C or low
18 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-C1 / 20 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-D1 / ADSREHAARKS (List all known wastes) MSDS O Yes O No SPECJAL INSTRUCTIONS SEND RESULTS to Carl Rowald IV and Greg Grand Received By SPECJAL WISTOUR SE SOW for email Received By Pint Received By Pint Sign Date/Time SE Date/Time Second By Pint Sign Date/Time Second By Pint Sign Date/Time Second By Pint Sign Date/Time Second By Pint Date/Time Second By Pint Sign Date/Time Second By Pint Date/Time Bate/Time Bate/Time Bate/Time Received By Pint Date/Time Bate/Time Bate		\$161021917	Y.	7/23/16		SILICA GEL	Aldehyde 16-06173-8-BLANK /			25C or low
19 Nh 7/23/16 SILICH GEL Aldehyde 16-06173-8-D1 4 20 Vh 7/23/16 SILICH GEL Aldehyde 16-06173-8-D1 4 ROSERAMARKS (List all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS Send Results to Carl Rowald IV and Greg Sociation of Carl Wiley and Send Results to Carl Boyald IV and Greg Sociation of Carl Wiley Send Results to Carl Rowald IV and Greg Sociation of Carl Wiley Send Results of Carl Wiley Send In Date/Time Received By Results of Carl Wiley Send In Date/Time Received By Carl Wiley Send In Date/Time Received By Carl Wiley Send In Date/Time Send In Date/Send In Date/Time Send In Date/Time Send In Date/Send In Date/Time Send In Date/Send In Date/Sen		S16T021918	8	7/23/16		SILICA GEL	Aldehyde 16-06173-8-c1 '			25C or low
20 Nh 7/23/16 SILICH GEL Aldehyde 16-06173-8-E1 i ROS/REMARKS (List all known wastes) MSDS Yes O No SPECIAL INSTRUCTIONS Sed Results to Carl Howald IV and Greg Sed Results to Carl Howald IV		S16T021919	VA	7/23/16		SILICA GEL	Aldehyde 16-06173-8-D1 /			25C or low
TOS/REMARKS (List all known wastes) MSDS O Yes No Send Results to Carl Rowald IV and Greg Send Results Sign LUCAL Results Received By Received By RECOND SIGN Received By RECOND SIGN RECOND S		S16T021920	8	7/23/16		SILICA GEL	Aldehyde 16-06173-8-E1 ;			25c or low
ALLELLE TABLE 10 Date Time Received By Print Sign Date Time Sign Date Time Sign Date Time Sign Date Time Sign Print Sign Print Sign Date Time Sign Print S	POSSIBLE SA	MPLE HAZARDS/R	EMA	RKS (List all	known wast	es) MSDS O Ye		. ==	Hold Time	
Disposal Method (e.g., Return to customer, per lab procedure, [Sed in pricess8] Disposal Method (e.g., Return to customer, per lab procedure, [Sed in pricess8] Disposal Method (e.g., Return to customer, per lab procedure, [Sed in pricess8] Disposal Method (e.g., Return to customer, per lab procedure, [Sed in pricess8]	Relinquished E	Joll Ju	7 7	ild 1	2/100	Date/Time	1 6	7-26-76/0500 S Date/Time SE SO	Matrix* = Soil DL = Sediment T = Solid Wi	= Drum Liquids = Tissue = Wipe
Disposal Method (e.g., Return to customer, per lab procedure, Ligad in process) Disposed By Disposed By Disposed By Disposed By	Relinquished E	220	3	Lod	\$ Q	Date/Time	in tasser land	Date/Time w		= Liquid = Vegetation = Vapor
Disposal Method (e.g., Return to customer, per lab procedure, Iged in process) On Sch. M. P. L.	Relinquished E					<u> </u>		Date/Time	= Air X = Drum Solids	= Other
	FINAL SAMPLE DISPOSITION	Disposal N	(e.g.,	Return to cus	tomer, per		2		OPPUBLIC	13,00

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Telephone No. 173-6861 MSN. 16-05 FW. 37		14.7				CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	LYSIS REQUEST	Page 3 of	of 3
Complete Originary Complet	Collector					Contact/Requesto	N.	Telephone No.373-6861	MSIN FAX 3	72-1878
Sample Analysis Singlook Work Package No. See Container Sample Analysis Sample Analysis Singlook Work Package No. 1/0 10 10 10 10 10 10 1	SAF No.				*	Sample Origin CARTRIDGE EVALU	ATTON	Purchase Order/Charge Code 202003/CB20		
Method of Shipment Date Time No.Type Container Sample Analysis Pairs and Return No. 1/0	Project Title	LUATION			Ŀ	Logbook/ Work Pa	ackage No.	loe Chest No. LTS-013		JUE
10 ab Number 10 a	Shipped To (L.	(qe				Method of Shipme	ent	Bill of Lading/Air Bill No.	7768 HH3	8 5294
1021921	Protocol 1/A			100		Data Turnaround			17011	
1021922	Sample No.	Cab ID	•	Date	Time	No./Type Container	Samp	ife Analysis		Preservative
1021922 VA 7723/16 SILICA GEL Aldehyde 16-06173-9-F1 (1021926 VA 7723/16 SILICA GEL Aldehyde 16-06173-9-H1 (1021926 VA 7723/16 SILICA GEL Aldehyde 16-06173-9-H1 (1021926 VA 7723/16 SILICA GEL Aldehyde 16-06173-9-H2 (1021926 VA		\$161021921	11.	7/23/16		SILICA GEL	Aldehyde 16-06173-8-EFF-BASE /			25C or low
1021923 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-11; 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-11; 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 Va 7/23/16 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 SILICA GEL Aldehyde 16-06173-8-18-18 1021926 SILICA GEL Aldehyde 16-06173-8-18-18 SILICA GEL Aldehyde 16-06173-8-18 SILICA GEL Aldehy		S16T021922	N.	7/23/16		SILICA GEL	Aldehyde 16-06173-8-FL 4			25C or low
1021926 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-H1; 1021926 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-H2; 1021927 VA Aldehyde 16-06173-8-H2; 10219		S16T021923	Z,	7/23/16		SILICA GEL	Aldehyde 16-06173-8-61 /			25C or 10W
TO21925 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-IN-BASE 4 HOLD HAZARDS/REMARKS (List all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carl Bowald IV and Greg Carlo of Send Assults to Carlo of Send Ass		S16T021924	5	7/23/16		SILICA GEL	Aldehyde 16-06173-8-H1 ;			25C or 10W
TO21926 VA 7/23/16 SILICA GEL Aldehyde 16-06173-8-IN-BASE 1 HAZARDSREMARKS (List all known wastes) MSDS O Yes O No SPECIAL INSTRUCTIONS Send Results to Carl Bowald IV and Greg Carl M. Howald 1: gov and Carl M. Howald 1: gov and Greg Carl M. Howa		\$161021925	V.	1/23/16		SILICA GEL	Aldehyde 16-06173-8-H2 *			25C or low
HAZARDSREMARKS (List all known wastes) MSDS O Yes © No SPECIAL INSTRUCTIONS Send Results to Carl Bowald IV and Greg Spoot Wastes and Results to Carl Bowald IV and Greg Spoot Wastes Sign Date/Time Received By REDEX Spoot Wastes Sign Date/Time Received By REDEX Spoot Wastes Sign Date/Time Received By REDEX Spoot Wastes Spoot Wastes Sign Date/Time Spoot Spoot Wastes Spo		\$161021926	V.	7/23/16		SILICA GEL	Aldehyde 16-06173-8-IN-BASE 4			25C or low
HAZARDSREMARKS (List all known wastes) MSDS O Yes © No SPECIAL INSTRUCTIONS Send Results to Carl Bowald I'V and Greg Monte of the Carl Bowald I'V and Greg Monte of the Carl Bowald I'V and Greg Monte of the Carl Wood of the Carl Bowald I'V of the Carl Wood of t			+					21		
HAZARDSREMARKS (List all known wastes) MSDS O Yes © No SPECIAL INSTRUCTIONS HAZARDSREMARKS (List all known wastes) MSDS O Yes © No Sead Results to Carl Bowald I'v and Greg Sead Researce Carl Bowald I'v and Greg Sead Researce Sead Received By REDEX Harder Sign Date/Time Received By REDEX Harder Sign Date/Time Received By REDEX Date/Time Sign Date/Time We was season between By Bisposed By			-						*5	
HAZARDSREMARKS (List all known wastes) MSDS O Yes © No SPECIAL INSTRUCTIONS Hold Record Record Record Record By Hold Sign Date/Time Received By REDEX M Hardon Print Sign Date/Time Received By REDEX W Hardon Print Sign Date/Time Received By REDEX M Hardon Print Sign Date/Time Received By REDEX Print Date/Time Received By REDEX Print Date/Time N = Mail Melhod (e.g., Return to customer, per lab procedure, lead in process) Print Sign Date/Time Hold Received By REDEX Print Date/Time N = Mail Melhod (e.g., Return to customer, per lab procedure, lead in process) Disposed By CONSON EX			-							
HAZARDS/REMARKS (List all known wastes) MSDS O Yes No SPECIAL INSTRUCTIONS Recal Results to Carl Bewald IV and Greg No Core Carl Mendal Strop and Carl Me			_						1 * 1	
Print Sign Date/Time Received by Print Sign Date/Time Second by Print Sign Date/Time SE = Se No + Harder Suff 7-26-76/050 S = SS No + Harder Suff 7-26-76/050 S = SS No + SE SUFF 7-26-76/050	POSSIBLE SA EPA TO-11A	MPLE HAZAROS	REM	RKS (List all	known was	otes) MSDS () Yes	⁹ √	rald IV and Greg tree SOW for email	Hold Time	
N Harden RPS S.44 7-26-16 1400 BaterTime Received By REDEX So = 50 So =	Relinquished E	10 Je	7	Sign Ma	th.	P.26-66 69 00 S	H	Date/Time 7-26-76 / 0950		= Drum Liquids
Disposal Method (e.g., Return to customer, per lab procedure, lased in process) CONSMICE Date-Time We we will be a supposed By CONSMINED Disposal Method (e.g., Return to customer, per lab procedure, lased in process)	Relinquished E	N T	Do.	7	7-26-	J40C)	FEDEX	_	E Sediment T Solid WI	= Tissue
Disposal Method (e.g., Return to customer, per lab procedure, Lased in process) CONSMIMEN	Relinquished E	A A		Led	.8	P	73	Date/Time	= Water V = Oil VA = Air X	= Vegetation = Vapor = Other
(BST) CONSMICED			(e.g.,	Return to cus	stomer, per	1 88	,	0	ŭ	
	DISPOSITION					9	JMMSMO) (T	4	182120	16 13.0

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C.3.9 1. 3-Butadiene



ANALYTICAL REPORT

Report Date: August 03, 2016

Robert (Buddy) Sosa Washington River Protection So PO Box 850, MSIN T6-02 Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

20162149

Workorder: 34-1620934

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021843				Collected: 07/22/2016
Lab ID: 1620934001				Received: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: \$16T021844 Lab ID: 1620934002				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1,3-Butadiene	0.0012	NA	NA	0.00	010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam;	ole)
Method: NIOSH 1024	San	Media: SK0 pling Parameter: Air	226-37 Sorbent To Jolume Not Provid		nalyzed: 08/02/2016
Lab ID: 1620934003				Re	eceived: 07/27/2016
Sample ID: \$16T021845				Co	ollected: 07/22/2016

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T021846 Lab ID: 1620934004					ted: 07/22/2016 /ed: 07/27/2016
Method: NIOSH 1024	See		226-37 Sorbent To	ube Analy	zed: 08/02/2016
	Result	pling Parameter: Air	Volume Not Provid	1ea	
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	< 0.0010	NA	NA	0.0010	

1,3-Butadiene	0.0010	NA	NA	0.0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent Tu Volume Not Provid	
Lab ID: 1620934005				Received: 07/27/201
Sample ID: S16T021847				Collected: 07/22/201

1.3-Butadiene	0.0012	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San	Media: SKO pling Parameter: Air	226-37 Sorbent To olume Not Provid		1: 08/02/2016
Lab ID: 1620934006				Received	d: 07/27/2016
Sample ID: \$16T021848				Collected	1: 07/22/2016

1,3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	San		alyzed: 08/02/2016		
Sample ID: S16T021849 Lab ID: 1620934007				32743	lected: 07/22/2016 ceived: 07/27/2016

Sample ID: \$16T021850				Collected	1: 07/22/2016
Lab ID: 1620934008				Received	i: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To Volume Not Provide		1: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021851				Collect	ed: 07/22/2016
Lab ID: 1620934009				Receiv	ed: 07/27/2016
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				ed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San	ube Analyzed: 08/02/2016		
Lab ID: 1620934010				Received: 07/27/2016
Sample ID: \$16T021852				Collected: 07/22/2016

1,3-Butadiene	<0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam	iple)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 08/02/2016
Lab ID: 1620934011				F	Received: 07/27/2016
Sample ID: S16T021853				C	collected: 07/22/2016

1,3-Butadiene	< 0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	le)
Method: NIOSH 1024	San		alyzed: 08/02/2016		
Sample ID: S16T021854 Lab ID: 1620934012					llected: 07/22/2016 ceived: 07/27/2016

Sample ID: \$16T021855				Colle	cted: 07/22/2016
Lab ID: 1620934013				Rece	ived: 07/27/2016
Method: NIOSH 1024	San		/zed: 08/02/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021856				Collected: 07/22/2
Lab ID: 1620934014				Received: 07/27/2
Method: NIOSH 1024	San	ube Analyzed: 08/02/20		
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: \$16T021857 Lab ID: 1620934015				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube			ube Analyzed: 08/02/2016
	San Result	npling Parameter: Air	olume Not Provid	led
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	<0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San		nalyzed: 08/02/2016		
Lab ID: 1620934016				Re	ceived: 07/27/2016
Sample ID: \$16T021858				Co	llected: 07/22/2016

1,3-Butadiene	< 0.0010	NA	NA	0.001	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	e)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				alyzed: 08/02/2016
Sample ID: S16T021859 Lab ID: 1620934017				0.07.00	lected: 07/22/2016 ceived: 07/27/2016

1.3-Butadiene	<0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San	Media: SKC 226-37 Sorbent Tube Ana Sampling Parameter: Air Volume Not Provided			
Lab ID: 1620934018				Received: 07/27/2016	
Sample ID: \$16T021860				Collected: 07/22/2016	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021861				Colle	cted: 07/22/2016
Lab ID: 1620934019				Rece	ived: 07/27/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To	46 SADM 1 (E. C.	yzed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	ì
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: S16T021862				Collected: 07/22/2016
Lab ID: 1620934020				Received: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	<0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San	Media: SKO pling Parameter: Air	226-37 Sorbent To olume Not Provid		ed: 08/02/2016
Lab ID: 1620934021				Receiv	ed: 07/27/2016
Sample ID: \$16T021863				Collect	ed: 07/22/2016

1,3-Butadiene	< 0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To Colume Not Provid		alyzed: 08/02/2016
Sample ID: S16T021864 Lab ID: 1620934022				350	llected: 07/22/2016 ceived: 07/27/2016

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San		zed: 08/02/2016		
Sample ID: \$16T021865 Lab ID: 1620934023					cted: 07/22/2016 ved: 07/27/2016

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

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Sample ID: S16T021866				Collected: 07/22/2016
Lab ID: 1620934024				Received: 07/27/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To Volume Not Provident	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San	Media: SK0 pling Parameter: Air	226-37 Sorbent Tu olume Not Provid		: 08/02/2016
Lab ID: 1620934025				Received	07/27/2016
Sample ID: \$16T021867				Collected	: 07/22/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	110
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San	Media: SKO pling Parameter: Air	226-37 Sorbent Tu olume Not Provid		nalyzed: 08/02/2016
Lab ID: 1620934026				Re	eceived: 07/27/2016
Sample ID: \$16T021868				Co	ollected: 07/22/2016

1,3-Butadiene	<0.0010	NA	NA	0.00	110
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To olume Not Provid		nalyzed: 08/02/2016
Sample ID: S16T021869 Lab ID: 1620934027				355	llected: 07/23/2016 ceived: 07/27/2016

Sample ID: \$16T021870				Colle	cted: 07/23/2016
Lab ID: 1620934028				Rece	eived: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To		yzed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T021871 Lab ID: 1620934029				Collected: 07/23/2 Received: 07/27/2
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To Volume Not Provident	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		: 08/02/2016
Lab ID: 1620934030				Received	: 07/27/2016
Sample ID: \$16T021872				Collected	: 07/23/2016

Lab ID: 1620934031			226-37 Sorbent To	Received: 07/27/2010
Method: NIOSH 1024	San			
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1.3-Butadiene	<0.0010	NA	NA	0.0010

1,3-Butadiene	< 0.0010	NA	NA	0.001	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	e)
Method: NIOSH 1024	San	Media: SKC 226-37 Sorbent Tube ampling Parameter: Air Volume Not Provided			alyzed: 08/02/2016
Sample ID: S16T021874 Lab ID: 1620934032				0.000	lected: 07/23/2016 eived: 07/27/2016

Sample ID: \$16T021875				Colle	cted: 07/23/2016
Lab ID: 1620934033				Rece	eived: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To Volume Not Provide		yzed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021876				Collected: 07/23	/2016
Lab ID: 1620934034				Received: 07/27	/2016
Method: NIOSH 1024	226-37 Sorbent To Volume Not Provid		2016		
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: \$16T021877				Collected: 07/23/2016
Lab ID: 1620934035	Received:			
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	< 0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	le)
Method: NIOSH 1024	San	Media: SKO pling Parameter: Air	226-37 Sorbent Tu olume Not Provid		alyzed: 08/02/2016
Lab ID: 1620934036				Re	ceived: 07/27/2016
Sample ID: \$16T021878				Col	llected: 07/23/2016

1,3-Butadiene	< 0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To olume Not Provid		nalyzed: 08/02/2016
Sample ID: S16T021879 Lab ID: 1620934037				100	llected: 07/23/2016 ceived: 07/27/2016

Sample ID: \$16T021880				Collec	ted: 07/23/2016
Lab ID: 1620934038				Recei	ved: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To Volume Not Provide		zed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021881				Colle	cted: 07/23/2016
Lab ID: 1620934039				Rece	eived: 07/27/2016
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To		lyzed: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010)

Sample ID: \$16T021882				Collected: 07/23/201
Lab ID: 1620934040				Received: 07/27/201
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	<0.0010	NA NA	NA	0.0	010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sam	ple)
Method: NIOSH 1024	San	Media: SKO pling Parameter: Air	226-37 Sorbent Tu olume Not Provid		Analyzed: 08/02/2016
Lab ID: 1620934041				R	eceived: 07/27/2016
Sample ID: \$16T021883				C	ollected: 07/23/2016

1,3-Butadiene	< 0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent To lolume Not Provid		nalyzed: 08/02/2016
Sample ID: S16T021884 Lab ID: 1620934042				31272	llected: 07/23/2016 ceived: 07/27/2016

Sample ID: \$16T021885				Collected: 07/23/2016
Lab ID: 1620934043				Received: 07/27/2016
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	< 0.0010	NA	NA	0.0010

Wed, 08/03/16 8:13 AM IHREP-V12.3 Page 9 of 12



Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021886				Collected	d: 07/23/2016
Lab ID: 1620934044				Received	d: 07/27/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To	50 S C C C C C C C C C C C C C C C C C C	d: 08/02/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

1,3-Butadiene	< 0.0010	NA	NA	0.0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			
Lab ID: 1620934045				Received: 07/27/2016
Sample ID: \$16T021887				Collected: 07/23/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	110
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/samp	ole)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				nalyzed: 08/02/2016
Lab ID: 1620934046				Re	eceived: 07/27/2016
Sample ID: S16T021888				C	ollected: 07/23/2016

Analyte 1.3-Butadiene	(mg/sample) <0.0010	Result (mg/m³) NA	Result (ppm) NA	RL (mg/sample) 0.0010	
********	Result	D 1/1 / 10			
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To Volume Not Provid		yzed: 08/02/2016
Sample ID: \$16T021889 Lab ID: 1620934047				327432	cted: 07/23/2016 ived: 07/27/2016

Sample ID: \$16T021890				Collected: 07/23/2016
Lab ID: 1620934048				Received: 07/27/2016
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	< 0.0010	NA	NA	0.0010

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

,				
Sample ID: \$16T021891				Collected: 07/23/2016
Lab ID: 1620934049				Received: 07/27/2016
Method: NIOSH 1024			226-37 Sorbent T	
	The second section is a second section of the section of the second section of the section of the second section of the second section of the second section of the secti	npling Parameter: Air	Volume Not Provid	led
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	< 0.0010	NA.	NA	0.0010

1.3-Butadiene	<0.0010	NA	NA	0.0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			
Lab ID: 1620934050				Received: 07/27/20
Sample ID: \$16T021892				Collected: 07/23/20

1,3-Butadiene	< 0.0010	NA	NA	0.0010)
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided			77.7	lyzed: 08/02/2016
Lab ID: 1620934051				Rece	eived: 07/27/2016
Sample ID: S16T021893				Colle	ected: 07/23/2016

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	SH 1024 Media: SKC 226-37 Sorbent Sampling Parameter: Air Volume Not Prov				
Sample ID: S16T021894 Lab ID: 1620934052					cted: 07/23/2016 lived: 07/27/2016

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
	/S/ Fred Rejali	/S/ Thomas J. Masoian
NIOSH 1024	08/03/2016 04:57	08/03/2016 07:59

Laboratory Contact Information

ALS Environmental 960 W Levoy Drive Salt Lake City, Utah 84123

Phone: (801) 266-7700 Email: alslt.lab@ALSGlobal.com Web: www.alsslc.com

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Workorder: 34-1620934

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 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	ACLASS (DoD ELAP) Utah (NELAC)	ADE-1420 DATA1	http://www.aclasscorp.com http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deg.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/qa/
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
Industrial Hygiene	AIHA-LAP, LLC (ISO 17025 and AIHA-LAP, LLC IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:	n residencia e vitatica e 300 descripcio e min	2.30 to 2.50 to 2.500	
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	http://www.aclasscorp.com
Soil, Dust, Paint ,Air	AIHA-LAP, LLC (ISO 17025, AIHA-LAP, LLC ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.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 Envrionmental 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

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Analysis Information

Workorder: 1620934

Limits: Historical/Performance Preparation: NA

Batch: IFID/7635 (HBN: 174019) Basis: ALS Laboratory Group Batch: NA

Prepared By: NA Analyzed By: Fred Rejali

Analysis: NIOSH 1024

Blank

MB: 511195 Analyzed: 08/02/2016 00:00

Units: mg/sample

Analyte Result MDL RL 1,3-Butadiene ND NA 0.00100

Analyzed: 08/02/2016 00:00

Units: mg/sample

Analyte Result MDL 1,3-Butadiene ND NA 0.00100

MB: 511201

1,3-Butadiene

Analyzed: 08/02/2016 00:00

Units: mg/sample

MDL Analyte Result RL 0.00100 ND 1,3-Butadiene NA

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 511196 LCSD: 511197

Analyzed: 08/02/2016 00:00 Analyzed: 08/02/2016 00:00

Dilution: 1 Dilution: 1

0.0305

Units: mg/sample Units: mg/sample Result %Rec QC Limits QC Limits Analyte Result Target % Rec RPD 78.0 117.6 99.2

0.0306

0.392

0.0 20.0

LCS: 511199 LCSD: 511200

Analyzed: 08/02/2016 00:00 Analyzed: 08/02/2016 00:00

0.0308

Dilution: 1 Dilution: 1 Units: mg/sample

Units: mg/sample Analyte Result Target % Rec QC Limits Result %Rec RPD QC Limits 1,3-Butadiene 0.0345 0.0342 78.0 117.6 0.0351 0.0 20.0

LCS: 511202 LCSD: 511203

Analyzed: 08/02/2016 00:00 Analyzed: 08/02/2016 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 0.0347 0.0342 78.0 117.6 0.0346 0.289 0.0 20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1620934

Limits: Historical/Performance Preparation: NA Analysis: NIOSH 1024

Basis: ALS Laboratory Group Batch: NA Batch: IFID/7635 (HBN: 174019)

Prepared By: NA Analyzed By: Fred Rejali

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ Fred Rejali	/S/ Thomas J. Masoian	
08/03/2016 04:57	08/03/2016 07:59	

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits RPD - Relative % Difference (Spike / Spike Duplicate)

🛦 - Sample result is greater than 4 times the spike added ND - Not Detected (U - Qualifier also flags analyte as not detected)

Sample and Matrix Duplicate less than 5 times the reporting limit
NA - Not Applicable

Result is above the calibration range
 QC results are not adjusted for moisture correction, where applicable

Compacing Comp	H . 4/N	1620934	4.				CHAII	N OF CUSTODY	//SAMPLE ANA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	2016 Page 1	20162149
Sample Analysis	Collector					Contact/R	tequestor			Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
Coppoint Work Package No. Date Date Time No.7ype Container Date Time No.7ype Container Date Time No.7ype Container Date Dat	SAF No.					Sample O CARTRIDGE	origin EVALUA	TION		Purchase Order/Charge Cod 202003/CB20		
Date Time No.Type Container Sample Analysis Parts and Return No. 1/O 7/	Project Title	ALUMITON	إا			Logbook/	Work Pa	ckage No.		loe Chest No. WTS - 31.	Temp.	J ICE
Date Time No.Type Container Sample Analysis Sample Analysis Sample Analysis Sample Analysis Sample Analysis 1,3-Butadiene 16-06172-9-A-A1 1	Shipped To (L	ab)				Method of	Shipmer	F		Bill of Lading/Air Bill No. 7		3 5296
1	Protocol 4/A					Data Tum 10 DAYS	around			Parts and Return No.	0	
3 VA 1/22/16 CERRORL TUBE 1,3-Butadiene 16-06172-9-h-A1 .	Sample No.			Date	Time	-	ntainer		Sam	ole Analysis	01	Preservative
1		\$167021843	VA			CHARCOAL TO		1,3-Butadiene 16-06				CHILL -4C
1,2-Butadiene 16-06172-9-A-BIANK CHARCOAL TUBE 1,2-Butadiene 16-06172-9-A-C1 Na 1/22/16 CHARCOAL TUBE 1,2-Butadiene 16-06172-9-A-C1 Na 1/22/16 CHARCOAL TUBE 1,2-Butadiene 16-06172-9-A-D1 Na 1/22/16 CHARCOAL TUBE 1,2-Butadiene 16-06172-9-A-E1 Na 1/22/16 CHARCOAL TUBE 1,3-Butadiene 16-06172-9-A-E1 Na 1/22/16 Na 1/22/16 CHARCOAL TUBE 1/3-Butadiene 16-06172-9-A-E1 Na 1/22/16 Na 1/		S16T021844	VA			CHARCOAL TO		1,3-Butadiene 16-06	6172-9-8-82 . ,			CHILL -4C
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1,3-Butadiene 16-06172-9-A-Cl		\$167021846	VA	7/22/16		CHARCOAL TO		.,3-Butadiene 16-06	6172-9-A-BLANK · ·			CHILL -4C
1		S16T021847	Z,		*	CHARCOAL TO	13	.,3-Butadiene 16-06	6172-9-A-C1 . }			CHILL -4C
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2 VA 7/22/16 CHARCOAL TUBE 1,3-Butadiene 16-06172-3-A-EI · Hold Time DSIFEMARKS (List all known wastes) MSDS O Yes NE Sond Results to Carl # Bowald IV, Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil DL Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil OL Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil OL Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil OL Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil OL Sign Date/Time Received By Print Sign 7-21-16/0900 S = Soil OL Sign Date/Time Received By REDEX Date/Time Received By REDEX Date/Time Waster V Sign Soil OL Sign Matrix Date/Time Received By REDEX Date/Time Received By REDEX Date/Time Notes Soil OL Sign Matrix Sign Matrix Sign Matrix Notes Soil OL Sign Matrix Sign Matrix Notes Soil OL Sign Matrix Sign		S16T021851	VA			CEARCOAL TO	201757	.,3-Butadiene 16-06	6172-9-A-G1			CHILL -4C
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Sign Date/Time Received By Print Sign 7-21-16/900 S = Soil DL See Sediment T	POSSIBLE SA	NMPLE HAZARDS/	REMA	RKS (List a	II known wa) MSDS (3 -	LINSTRUCTIONS sults to Carl W is Howalderl.gov, at Y S Moore@rl.gov at Contract # 555 E 9	oosald IV, dd Greg Moore, see SOW for email	Hold Time	
Date/Time Received By REDEX S. + 12 - 26 - 16 / 1436 S 50 = 50 id V	Relinquished E	1	1 3	Sign	W.	Date/Time		>	Sign Sign	Date/Time	ii Soii	= Drum Liquids
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Sign		S16T021858	Z.		22/16		CHARCOAL TUBE		1 1	1			CHILL -4C
Sign		\$16021859	V.		22/16	0.5%	CHARCOAL TUBE						CHILL -4C
Sign		\$161021860	ZV.		22/16		CHARCOAL TUBE		liene 16-06172-9-B-El	,			CHILL -4C
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Date/Time Received By Disposed By Disposed By Disposed By A Color Disposed By	elinquished E	Woll SW I	20	2 7 3	Wald	7.2	Date/Time L. C. 0900 Date/Time	* *	Harder Sadl		~ % % v	Matrix*	Drum Liqui Tissue Wipe
Disposal Method (e.g., Return to customer, per lab procedure) used in process) Fred Re Ja G. 08/02/16	Relinquished E	A	3	2	and		-	Received By/ Received By	asselfemila	CASOU OF P	308°	> × × spilo	= Vegetation = Vapor = Other
	INAL SAMPLE	Disposal Meth	od (e.g.,	Retu	im to custom	her, per l	ab procedure, use	d in process)	Fred Re	jali.	08/02/16	Date	300

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N. N.					400	CHAIN OF CHETCHVISAMPI E ANALVSIS RECHEST	I VSIS REDITEST	20162149	162149
					5	AIN OF COSTOD INSAMILEE AND		Page	3 of 6
Collector					Contact/Requestor	tor		MSIN FAX	X 372-1878
SAF No.					Sample Origin	MATION		5 T	
Project Title	NOTE				Logbook/ Work Package No.	Package No.	loe Chest No. W. TS - 0/3	Temp.	ON ICE
Shipped To (Lab)					Method of Shipment	nent	Bill of Lading/Air Bill No. 7768		44385296
Protocol N/A					Data Turnaround	P	Parts and Return No. 4	1.0	
Sample No.	Lab ID		Date	Time	No./Type Container		Sample Analysis		Preservative
	S16T021863	\$	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-B-H1			CHILL -4C
	S16T021864	\$	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-B-H2 · ·			CHILL -4C
	S16T021865	5	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-EFF-A-BASE			CHILL -4C
	S16T021866	V.	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-EFF-B-BASE			CRILL -4C
	S16T021867	N.	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-IN-A-BASE			CHILL -4C
	S16T021868	5	7/22/16		CHARCOAL TUBE	1,3-Butadiene 16-06172-9-IN-B-BASE			CHILL -4C
	S16T021869	8	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-A1			CHILL -4C
	\$167021870	N.	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-A2			CHILL -4C
	S16T021871	5	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-B1 '			CHILL -4C
	\$167021872	5	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-BLANK			CHILL -4C
OSSIBLE SAME	PLE HAZARDS/RE	MAP	KS (List all know	m waste	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl W Howald IV, GRAGOTY S. Monaddell gov, and Greg Woore, Gragory S. Mooreeki.gov see SOR for email Reference Contract # 55502 RISERSE 1024 CHILL BELOW -4 C		Hold Time	
Relinquished By		0	Sign	;		Sy Print Sign	Date/Time	Ma	trix*
Sharon (Relinquished By	SW Harder	\$ 2	241	7-26-16 7-26-16	1/09/38 1/406	Harder Strate	7-24-7-45/09/20 S = Date/Time SE = SO = SU = SU =	-	
Relinquished By	*	1	a		0	anny to the familial of	O O TION	= Water = Oil = Air	V = Vegetation VA = Vapor X = Other
Relinquished By		2			Date/Time Ke	Keceived by	Sa	= Drum Solids	
FINAL SAMPLE DISPOSITION	isposal Method (e	9.	etum to custome	r, per la	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By R	0/80 . 17"	Date/Time Date/Time 2.	Time 2300

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Comparison Com						СНА	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		20162149 Page 4 of	9
Sumple Code	Collector					Contact/Request	or	1 1	¥.	821
Logbook Work Peacage No. Logbook Work Peacag	SAF No.				8	Sample Origin CARTRIDGE EVALU	MILITAN	10.7		
Date Time No. Type Container Sumple Arabysis Parts and Return No. 41/07/1 Date Time No. Type Container Li-Buttaclene 15-05/17-9-A-D1 Calaboola. TUBE 1,3-Buttaclene 15-05/17-9-A-D1 Calaboola. TUBE Calaboola. TUBE 1,3-Buttaclene 15-05/17-9-A-D1 Calaboola. TUBE Calabo	Project Title	LIBITON				Logbook/ Work P	ackage No.	loe Chest No. LUTS -0/3	emp. ON 7	37:
Date Time No.Type Container Sample Analysis Parts and Return No. 1/0.7/ Via 7/22/16 Clair Container Li-Buttadiene E-06173-9-h-01 Clair Coh. Li-Buttadiene E-06173-9-h-01 Li-Buttadiene	Shipped To (La	(qs				Method of Shipm	ent	Bill of Lading/Air Bill No. 7768	4438 52	96
Date Time No.Type Container Sample Analysis	Protocol 1/A					Data Turnaround		Parts and Return No. 4/07	,	
Var 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-A-D1 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-A-D2 CHARCOAL TUBE 1,3-Butadiene 16-06174-1-A-D2 CHARCO	Sample No.	Lab ID	-	Date	Time	No /Type Container	Sampl	le Analysis	Pn	servative
VA 7/23/16 CERROAL TOBE 1,3-Butadiene E-06133-9-A-E1 .		\$167021873	8	-		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-Cl		CHI	LL -4C
VA 7/23/16 CEARCOLL TURE 1,3-Butadiene 16-06173-9-A-E1 .		\$167021874	V.			CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-D1 .		CHI	75- TT
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiane 16-06173-9-A-61 , i CHARCOAL TUBE 1,3-Butadiane 16-06173-9-A-61 , i CHARCOAL TUBE 1,3-Butadiane 16-06173-9-A-62 , CHARCOAL TUBE 1,3-Butadiane 16-06173-9-A-62 , CHARCOAL TUBE 1,3-Butadiane 16-06173-9-B-A-2 , CHARCOAL TUBE 1,3-Butadiane 16-06173-9-B-A-2 , CHARCOAL TUBE 1,3-Butadiane 16-06173-9-B-A-2 , CHARCOAL TUBE 1,3-Butadiane 16-06173-9-B-A-1 , CHARCOAL TUBE 1,3-BUTAM		\$167021875	V.			CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-E1 . *		CHI	26- 32
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiane 16-06173-9-A-GI 1 1 1 1 1 1 1 1 1		\$167021876	V.			CHARCOAL TUBE			CHI	LT -4C
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-A-B1 VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-B-A1 VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene		\$167021877	Y.			CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-G1 , ;		. CHI	
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiane 16-06173-9-B-A1 1		\$167021878	N.			CHARCOAL TUBE	1,3-Butadiene 16-06173-9-A-R1 . >		CHI	
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-B-A2 CARACOAL TUBE 1,3-Butadiene 16-06173-9-B-A2 CARACOAL TUBE 1,3-Butadiene 16-06173-9-B-B1 VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-B-B1 VA 7/23/16 CALL RELATIONS CALLA READING CALLA RELATIONS CALLA		\$167021879	VA	_		CHARCOAL TUBE			СЯІ	Tr -4C
VA 7/23/16 CHARCOAL TUBE 1,3-Butadiene 16-06173-9-B-B1 " Poid Time		\$167021880	VA		P.	CHARCOAL TUBE			Сил	
SREMARKS (List all known wastes) MSDS Yes No SPECIAL INSTRUCTIONS SPECIAL INSTRUCTIONS SPECIAL INSTRUCTIONS SPECIAL INSTRUCTIONS Hold Time Sign Sign Sign Second Sec		S16T021881	V.	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-A2	*	CHI	TT -4C
Sign Date/Time Received By Print Sign Date/Time Second Sec		\$167021882	V.	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-B1 . "		CRI	
Sign Date/Time Received By Print Sign Date/Time S = Soil DL = Pate/Time Scorpt Handle Start 7-24-14 0906 S = Soil DL = Pate/Time Received By Print Sign Date/Time S = Soil DL = Pate/Time Section Start Soil Date/Time Section Start Soil Start Soil Start Soil Start Soil Start Soil Soil Start Soil Soil Soil Soil Soil Soil Soil Soil	OSSIBLE SA	MPLE HAZARDS	REMA	RKS (List all F	mown wast	es) MSDS O Yes	g ⊙	ě	īme	
Solid WW Solid WW Date/Time Received By Date/Time Of the County of	Aunen L	Holber	7	Sign	27		Harder Sutt	Date/Time S SE Date/Time SE	Matrix* DL =	um Liquid sue
Disposal Method (e.g., Return to customer, per lab procedure, used in process) Free Per 1 08/02/16 23	telinquished B	SW Harder	7	2000	26-16	1.0	di 12880	So Sterrime W	∑~> ×	pe uid getation por ner
Disposal Method (e.g., Return to customer, per lab procedure, used in process) Fred Rejal. 08/02/16	Relinquished B		>	-		Date/Iime (Kec		S		
	INAL SAMPLE	Disposal Method	(e.g.,	Return to cust	omer, per l	ab procedure, used in	, ,	ah. 08102116	Date/Time 2 3 0 0	

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	15			5	CHAIN OF COSTOD (SAMPLE ANALTSIS NEGOES!			
Ide TO (Lab) S No. Lab ID S 16T021884 S 16T021886 S 16T021886 S 16T021886 S 16T021886 S 16T021887	1 1 2						Page 5	of 6
To (Lab) To (Lab) To (Lab) S No. Lab ID S LGT021883 S LGT021885 S LGT021886 S LGT021886 S LGT021886 S LGT021886 S LGT021886	25			Contact/Requestor	estor	Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
### TOTAL TO				Sample Origin	HIGHTION	Purchase Order/Charge Code 202003/CB20		
TO (Lab) SLET021883 SLET021884 SLET021885 SLET021886 SLET0218887 SLET0218887				Logbook/ Work Package No.	k Package No.	Ice Chest No. WTS-013	3 Temp. OW	ICE
a No. LabiD signorms				Method of Shipment	pment	Bill of Lading/Air Bill No. 7	8844 8921	9575 8
S No. Lab ID S16T021883 S16T021884 S16T021886 S16T021886 S16T021886 S16T021887 S16T021887				Data Turnaround	pur	Parts and Return No.	41071	
	L	Date	Time	No./Type Container		Sample Analysis		Preservative
	_	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-BLANK '			CHILL -4C
3	-	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-C1 *			CRILL -4C
		7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-D1			CHILL -4C
	_	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-E1 "			CHILL -4C
		7/23/16.		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-F1 '	18		CHILL -4C
	17/2	VA 7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-G1 ·			CHILL -4C
S16T021889 VA		7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-8-H1			CHILL -4C
\$16T021890 VA		7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-B-H2 .			CHILL -4C
S16T021891 VA	1/2	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-EFF-A-BASE :			CHILL -4C
\$16T021892 VA	_	7/23/16		CHARCOAL TUBE	1,3-Butadiene 16-06173-9-EFF-B-BASE			CRILL -4C
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes	RKS RKS	(List all kno	wn waste	Y O sosw (sa	Yes No SPECAL INSTRUCTIONS Sand Results to Carl W dowald IV, Carl W Mowaldel, gov, and Gree Moore, Gregory_S_Moore@il.gov, sand Gree mail Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C	ovald IV, red soore, and Greg Moore, see SOW for email 102	Ной Тгле	
Relinquished By Print Shew 60 Md Pe M Relinquished By SW Harder	Sign 7	177	AC.C.		Received By Print Sign Scott Harder Study 7. Received By FEDEX	7-25-14/0500 S Date/Time SE		The state of the s
WRPS Selinquished By	1	200	37.7	DateTime	Becomed by Age 11 Jamilla, 10 Self	Date/Time	= Sludge L = Water V = Oil VA	= Liquid = Vegetation = Vapor = Other
Relinquished By	P			Date/Time R	Received By	Date/Time() (185		
FINAL SAMPLE Disposal Method (e.g., Return to customer, per lab procedure, used in process) DISPOSITION	Retu	m to custom	ier, per la	ib procedure, used in	In process) Disposed By (L.)	14 6. 081	Date/Time 08/02/16 23	7.300

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ContactR ContactR	Page 6 of 6 Feducator Telephone No. 373-686 Page 6 of 6 Feducator Telephone No. 373-686 Page 6 of 6 Feducator Telephone No. 373-686 Page 6 of 6 Feducator Page 5 Feducator Page 6 Feducator Page 6 Feducator Page 6 Feducator Feducator Page 6 Feducator Page 6 Feducator Page 6 Feducator Feducator Page 6 Feducator Feducator Page 7 Feducator Feducator Feducator Page 6 Feducator Fe
Contact/Requesto Contact/Requesto Contact/Requesto Contact/Requesto Contact/Requesto Carrelloe	Telephone No.312-6861 MSIN Telephone No.312-6861 MSIN Telephone No.312-6861 MSIN Telephone Source Purchase Orden/Charge Code Los Chest No.
Sample Origin Sample Origin Sample Origin	Purchase Order(Charge Code Purchase Order(Charge Code Coccosycaso Chest No. U_S < 013
E SAMPLE HAZARDS/REMAR/S (List all known wastes) MSDS (O Yes	top Chest No. 175.013 Temp. 0 top Chest No. 175.013 Temp. 0 top Chest No. 1768 4438 Parts and Return No. 4/07/ Sample Arabysis Catana 16-06173-9-IR-A-BASE Catana 16-06173-9-IR-B-BASE Catana 16-06173-9-IR-B-BASE Catana 16-06173-9-IR-B-BASE Catana 16-06173-9-IR-BASE Catana 16-06173-9-
Nethod of Shipme	Bill of Lading/Air Bill No. 7768 4438 Parts and Return No. 4/07/1 Sample Analysis C diene 16-06173-9-IN-B-BASE ., C C C C C C C C C
E SAMPLE HAZARDS/REMARKS (List all known wastes) Data Turnaround	Parts and Return No. 41071
S16T021894 VA 7/23/16 CHARCOAL TUBE S16T021894 VA 7/23/16 CHARCOAL TUBE CHARCOAL TUBE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	ple Arelysis
S16T021894 VA 7/23/16 CRARCOAL TUBE 1,3-Butadia S16T021894 VA 7/23/16 CRARCOAL TUBE 1,3-Butadia OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes () No	
S16T021894 VA 7/23/16 CHARCOAL TUBE 1,3-Butadit	,
OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes () No	
OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes No	
OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes () No	
OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes () No	
OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes No	
	SPECIAL INSTRUCTIONS Send Results to Carl # Howald IV, Carl # Howaldsl.gov, and Carg Moore, Gregory_Moore(Try see 50% for email Reference Contract # 55502 NIOSH 1024 CHILL EELOM -4 C
Relinquished By Print Sign Date/Time Received By	Print Sign , Date/Time Matrix*
- WILL 7-26-16 6900 Scott	7-26-16/0506 S = Soil
3W Harder Received By NRPS 8.4/L 7-26-16/1400	SC = Solid VM
ate/Time	A RECOUNT OF SELL OF THE CONTROL OF STORY OF STO
Relinquished By Date/Time Received By	ım Solids
FINAL SAMPLE Disposal Method (e.g., Return to customer, per lab procedure, used in process) pishosmon	Fred K. 1 68/02/16 2300

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C.3.10 Pyridines



ANALYTICAL REPORT

Report Date: August 03, 2016

Robert (Buddy) Sosa Washington River Protection So PO Box 850, MSIN T6-02 Richland, WA 99352 Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

20162147

Workorder: 34-1620929

Client Project ID: Washington River Protection

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021785				Collected: 07/22/2016
Lab ID: 1620929001				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2.4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021786 Lab ID: 1620929002				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021787 Lab ID: 1620929003				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

Environmental 🏬

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Wed, 08/03/16 12:55 PM

IHREP-V12.3



Workorder: 34-1620929

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

2,4-Dimethylpyridine	<0.50	NA	NA	0.50
Pyridine	<0.50	NA	NA	0.50
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7 50mg Jolume Not Provid	
Sample ID: \$16T021788 Lab ID: 1620929004				Collected: 07/22/2016 Received: 07/27/2016

Sample ID: S16T021789 Lab ID: 1620929005				Collected: 07/22/2016 Received: 07/27/2016
		15 G 152 N 52/05/		
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal 1 /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021790 Lab ID: 1620929006				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San	Media: SKC 100 npling Parameter: Air \		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T021791				Collected: 07/22/2016
Lab ID: 1620929007				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



Workorder: 34-1620929

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analyte	San Result (ug/sample)	Result (mg/m²)	Volume Not Provid Result (ppm)	RL (ug/sample)
				Dente Control Control Control
				Dente Control Control Control
Pyridine	(ug/sample) <0.50	Result (mg/m') NA	Result (ppm)	RL (ug/sample) 0.50

Sample ID: S16T021793				Collected: 07	7/22/2016
Lab ID: 1620929009				Received: 07	7/27/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 08	/02/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Pyridine	<0.50	NA	NA	0.50	
2,4-Dimethylpyridine	< 0.50	NA	NA NA	0.50	

Sample ID: \$16T021794 Lab ID: 1620929010				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 08/02/2016 ed		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021795				Collected: 07/22/2016
Lab ID: 1620929011				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



Workorder: 34-1620929

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Pyridine 2,4-Dimethylpyridine	<0.50 <0.50	NA NA	NA NA	0.50 0.50
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 08/02/2016 ed		
Sample ID: \$16T021796 Lab ID: 1620929012				Collected: 07/22/2016 Received: 07/27/2016

Sample ID: \$16T021797 Lab ID: 1620929013				Collected: 07/22/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube Analyzed 100/50mg Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021798 Lab ID: 1620929014				Collected: 07/23/2016 Received: 07/27/2016	
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube Analyzed: 08/02/201 100/50mg Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
Pyridine	<0.50	NA	NA	0.50	
2,4-Dimethylpyridine	<0.50	NA	NA	0.50	

Sample ID: S16T021799				Collected: 07/23/2016
Lab ID: 1620929015				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



Workorder: 34-1620929

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

2,4-Dimethylpyridine	<0.50	NA	NA	0.50
Pyridine	<0.50	NA	NA	0.50
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 08/02/2016 ed		
Sample ID: \$16T021800 Lab ID: 1620929016				Collected: 07/23/2016 Received: 07/27/2016

Sample ID: S16T021801 Lab ID: 1620929017				Collected: 07/23/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 08/02/2016 ed		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021802 Lab ID: 1620929018				Collected: 07/23/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7 50mg Jolume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T021803				Collected: 07/23/2016
Lab ID: 1620929019				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



Workorder: 34-1620929

Client Project ID: Washington River Protection

So Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T021804				Collected: (07/23/2016
Lab ID: 1620929020				Received: (07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid		08/03/2016
Analyte	Result (ug/sample)	Result (mg/m²)	Result (ppm)	RL (ug/sample)	
Pyridine	<0.50	NA	NA	0.50	
2,4-Dimethylpyridine	<0.50	NA	NA	0.50	

Sample ID: \$16T021805 Lab ID: 1620929021				Collected: 07/23/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 750mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021806 Lab ID: 1620929022				Collected: 07/23/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T021807				Collected: 07/23/2016
Lab ID: 1620929023				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



Workorder: 34-1620929

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: S16T021808				Collected: 07/23/2016
Lab ID: 1620929024				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	(1941년) - 12 (1945년) 201년 (2017년) 201년 (2017년) - 1841년
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021809				Collected: 07/23/2016
Lab ID: 1620929025				Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: \$16T021810 Lab ID: 1620929026				Collected: 07/23/2016 Received: 07/27/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	1150
Analyte	Result (ug/sample)	Result (mg/m³)	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. - (HBN: 173960)

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.

LCSD 511002 fails RPD for 2,4-dimethylpyridine but passes percent recovery.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	
NIOCII 4642 Mad	/S/ Steven Yourstone	/S/ Thomas J. Masoian	
NIOSH 1613 Mod.	08/03/2016 10:04	08/03/2016 12:45	

Page 7 of 9 Wed, 08/03/16 12:55 PM IHREP-V12:3



Workorder: 34-1620929

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Laboratory Contact Information

ALS Environmental Phone: (801) 266-7700 960 W Levoy Drive Email: alslt.lab@ALSGlobal.com Salt Lake City, Utah 84123 Web: www.alsslc.com

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	ACLASS (DoD ELAP)	ADE-1420	http://www.aclasscorp.com
	Utah (NELAC) Nevada	DATA1 UT00009	http://health.utah.gov/lab/labimp/ http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deg.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/ga/
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
Industrial Hygiene	AIHA-LAP, LLC (ISO 17025 and AIHA-LAP, LLC IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	http://www.aclasscorp.com
Soil, Dust, Paint ,Air	AIHA-LAP, LLC (ISO 17025, AIHA-LAP, LLC ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	http://www.aclasscorp.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.

< 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.

NA = Not Applicable.
** No result could be reported, see sample comments for details.



Workorder: 34-1620929

Client Project ID: Washington River Protection

So

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

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: 1620929

Limits: Historical/Performance
Basis: ALS Laboratory Group
Batch: NA
Batch: NA
Batch: ISVO/3081 (HBN: 173960)
Prepared By: NA
Analyzed By: Steven Yourstone

Blank.

LMB: 510997 Analyzed: 08/02/2016 12:20

Units: ug/sample

 Analyte
 Result
 MDL
 RL

 Pyridine
 ND
 NA
 0.500

 2,4-Dimethylpyridine
 ND
 NA
 0.500

LMB: 511000 Analyzed: 08/03/2016 02:41

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: 510998 LCSD: 510999
Analyzed: 08/02/2016 12:40 Analyzed: 08/02/2016 12:59
Dilution: 1 Dilution: 1
Units: ug/sample Units: ug/sample

Result % Rec Result Target % Rec QC Limits RPD QC Limits Pyridine 1.54 2.00 77.1 61.8 141.1 1.90 95.0 20.8 0.0 22.1 2,4-Dimethylpyridine 1.20 2.00 59.8 51.7 130.6 1.47 73.3 20.4 0.0 22.2

LCS: 511001 LCSD: 511002

Analyzed: 08/03/2016 03:00 Analyzed: 08/03/2016 03:20

2.00

Dilution: 1 Dilution: 1

1.14

Units: ug/sample Units: ug/sample % Rec Analyte Result Target %Rec QC Limits Result RPD QC Limits Pyndine 1.85 2.00 92.5 141.1 2.14 22.1 61.8 107 14.8 0.0

57.1

51.7

130.6

1.51

75.7

28.0

0.0

22.2

QCS V4 1

Comments

2,4-Dimethylpyridine

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.

LCSD 511002 fails RPD for 2,4-dimethylpyridine but passes percent recovery.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ Steven Yourstone	/S/ Thomas J. Masoian	
08/03/2016 10:04	08/03/2016 12:45	

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits RPD - Relative % Difference (Spike / Spike Duplicate)

A - Sample result is greater than 4 times the spike added ND - Not Detected (U - Qualifier also flags analyte as not detected)

Sample and Matrix Duplicate less than 5 times the reporting limit
NA - Not Applicable

Result is above the calibration range
 QC results are not adjusted for moisture correction, where applicable

Page 1 of 1 Wednesday, August 03, 2016

N/A II III	1620929		11		CHAI	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	ALYSIS REQUEST Page	20162147 Page 1 of 3
Collector					Contact/Requestor			MSIN T6-05 FAX 372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	VIION	- 3	
Project Title	HISTON				Logbook Work Package No.	sckage No.		Temp. OD JEE
Shipped To (Lab)	(qı				Method of Shipment	ut .		4458 S246
Protocol N/A					Data Turnaround		Parts and Return No. 74/0	
Sample No.	CabiD		Date	Time	No JType Container	Sam	Sample Analysis	Preservative
	S16T021785	\$	7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-A1		N/A
	S16T021786	٧A	7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-A2 ~		N/A
	S16T021787	V.	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-B1		N/A
	8167021788	Y.	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-BLANK .		N/A
	8161021789	Y.	7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-C1 '		N/N
	\$167021790	5	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-D1 (N/N
	S16T021791	Z,	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-E1;		N/A
	S16T021792	5	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-EFF-BASE -		N/A
, i	\$167021793	V.	7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-F1 1		N/A
4	\$161021794	N.	7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-61 /	15	N/A
POSSIBLE SA	MPLE HAZARDS/I	REMAI	RKS (List all)	SM TWOWN WE	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS (), Yes	O No SPECIAL IN Send Resured Resured Respond Respond Respond Respond Respond Resured R	Hold Time Mald IV and Greg id see SOW for email	Time
Relinquished By	sy Print		Sign		Date/Time Reco	Received By Print Sign	502 Date/Time	Matrix
Sharon L	Molden M	1	Mals	2.5	1 2000 05.00 S. S. Date Time Reco	Scott Harder SHILL	7-26-14/0900 S = Soil Date/Time SE = Sediment	ent P.
WRPS 24	17+R	7	1-77-1	114				id WI = Wipe dge L = Liquid ter V = Venetation
Relinquished By)	Jedo	2	D	Taulan Jasseef ann Vailasell OF 3 Received By Date Time	410	.s×
FINAL SAMPLE DISPOSITION	Disposal	(e.g., f	Return to cus.	tomer, pe	Method (e.g., Return to customer, per lab procedure used in process)	Disposed By		Date/Time
Distroguistr						Contract to the second		

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N/A						The state of the s		2016	1776
-					<u>ਝ</u>	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	NALYSIS REQUEST	Page 2 of	of 3
Collector					Contact/Requestor	estor	Telsphone No ₃₇₃₋₆₈₆₁	MSIN FAX 372-1878	72-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	PLUATION	Purchase Order/Charge Code 202003/CB20		
Project Title	MATION				Logbook/ Work Package No.	k Package No.	Ice Chest No. W. + S. o. 15 Temp.	(5 Temp. O.D.	1901
Shipped To (Lab)	(qı				Method of Shipment	pment	Bill of Lading/Air Bill No. 77(88 4438	2296
Protocol N/A					Data Tumaround	pun	Parts and Return No. 4	11014	
Sample No.	LabID		Date	Time	No./Type Container		Sample Analysis		Preservative
	S16T021795	×.	7/22/16		CHARCOAL TUBE	Pyxidines 16-06172-10-H1 f			N/A
	S16T021796	V.	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-H2 *			N/A
	S16T021797	\$	VA 7/22/16		CHARCOAL TUBE	Pyridines 16-06172-10-IN-BASE :			N/A
	S16T021798	\$	7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-A1 K			N/A
	S16T021799	\$	7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-A2 #			N/A
	\$16T021800	8	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-B1 '			N/A
	S16T021801	\$	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-BLANK,			N/A
	\$167021802	K	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-C1 &		y	N/A
	S16T021803	Y.	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-D1 \			N/A
	S16T021804	8	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-E1 4			N/A
POSSIBLE SA	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes . 💿 No	EMA	RKS (List all kr	nown wast	es) MSDS ()	Yes No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Moore Carl W Howald@rl.gov and Gregory_S_Moore@rl.gov see SOW for email RELEASE 9	Howald IV and Greg and ov see SOW for email	Hold Time	· .
Relinquished B	Welle &	13	Sign // Li	7-6	Date/Time R	Scort A	Date/Time	= Soil DL	= Drum Liquids
SWWHärder WRPS	000	1	7-26-16	1400	te/Time	Received By REDEX		= Sediment T = Solid WI = Sludge L	= Tissue = Wipe = Uquid
Relinquished By Relinquished By	7	2	Jes		Date/Time R	Received By Cassell Tanni Vac as SA Received By	Partie Date Time	= Water V = Oil VA = Air X = Drum Solids	= Vegetation = Vapor = Other
FINAL SAMPLE DISPOSITION	Disposal	e.g.,	Return to custo	mer, per la	Method (e.g., Return to customer, per lab procedure (used i	Used in process) Disposed By		Date/Time	1035
	33								

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	12				CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	20162147 Page 3 of	147 of 3
Collector					Contact/Requestor	JC	Telephone No.373-6861	MSiN FAX 372-1878	2-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	MIION	Purchase Order/Charge Code 202003/CB20	- 1	
Project Title	LUMITION				Logbook/ Work Package No.	ackage No.	loe Chest No. W. S - 013	S Temp. ON ICE	TCE
Shipped To (Lab)	ab)	i i			Method of Shipment	ent	Bill of Lading/Air Bill No. 77L8 4438	8544 87	5296
Protocol 4/A	7				Data Turnaround		Parts and Return No.	41071	
Sample No.	Lab ID		Date	Time	No./Type Container	Sampl	Sample Analysis		Preservative
	\$167021805	Ą	7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-EFF-BASE			N/A
	S16T021806	Z.	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-F1 .	4		N/R
	S16T021807	R	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-61	101		N/A
	\$167021808	VA	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-H1 -			N/A
	\$167021809	Y.	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-H2 ·			N/A
	S16T021810	N.	VA 7/23/16		CHARCOAL TUBE	Pyridines 16-06173-10-IN-BASE .4			N/A
		\Box				•			
								824	
OSSIBLE S/	AMPLE HAZARDS/R	SEMA	RKS (List all.)	known was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes 🕟 No	SPECIAL INSTRUCTIONS Send Results to Carl Bowald IV and Greg Moore Carl W Rowald&rl.gov and Carl W Rowald&rl.gov and RELEASE RELEASE Reference Contract # 55502	ald IV and Greg ee SOW for email	Hold Time	
Relinquished By	By Print	1 3	Sign 1 Malek	172/03	72-16 ONO S	Harder Settle	Date/Time 26-76/0900	Matrix	= Drum Liquids
Relinquished By		100001110	3º.4/L	7-26		Received By FEDEX /	1 8 8 8	= Solid WI = Sludge L	= IISSUe = Wipe = Liquid
Relinquished By	33 125	7	appar		Date/Time Rec	Received By June 1000 June 105 (C)	Date Time w = Wate	> × × solids	= Vegetation = Vapor = Other
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure)	(6.9.	Return to cust	tomer, per	lab procedure used in process	Ag pasodsig (Second		Date/Time 8/2/46 4035	\ \times_{\tilde{\chi}}
on solumos IIV	nieining hazardous r	mater	fals shall be p	icked up by	v requestor and retume	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A-60	4.6003.982 (03/05)

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C.3.11 Nitrosamines

W607075, Page 1 of 17

55503 R5



RJ LeeGroup, Inc. | Columbia Basin Analytical Laboratories 2710 North 20th Avenue, Pasco WA 99301 Tel: (509) 545-4989 | Fax: (509) 544-6010

Contract No.:

Carl Howald IV 08/18/16

Washington River Protection Solutions, LLC P.O. Box 850 MSIN H6-16 Richland, WA 99352

Project: Cartridge Evaluation

Subject: Nitrosamines Analysis Report, Group Number 20162148

Enclosed is the final report for group 20162148 number analyzed for Nitrosamines using NIOSH 2522-Modified. This group number 20162148 has been assigned a Columbia Basin Analytical Laboratories login order number of W607075. 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 26 samples on 07/26/16 to be tested for Nitrosamines. The samples were analyzed in accordance with NIOSH 2522-Modified for N-Nitrosodimethylamine, N-Nitrosomethylethylamine, N-Nitrosodiethylamine, N-Nitrosodiethylamine, N-Nitrosodiethylamine, N-Nitrosopiperidine, N-Nitrosopyrrolidine, and N-Nitrosomorpholine. All results have been corrected for desorption efficiency and measurable levels in the blanks.

Positive Results

There were detectable	nitrosamines concer	ntrations above the reporting limit in the san	nples.		
16-06172-11-A1	W607075-01	N-Nitrosodimethylamine	0.416	µg/tube	
16-06172-11-A1	W607075-01	N-Nitrosodi-n-butylamine	0.024	μg/tube	
16-06172-11-A1	W607075-01	N-Nitrosodi-n-propylamine	0.052	µg/tube	
16-06172-11-A1	W607075-01	N-Nitrosopyrrolidine	0.024	µg/tube	
16-06172-11-A1	W607075-01	N-Nitrosodimethylamine	0.043	µg/tube	
16-06172-11-H1	W607075-11	N-Nitrosodiethylamine	0.050	μg/tube	
16-06172-11-H1	W607075-11	N-Nitrosodimethylamine	0.359	µg/tube	
16-06172-11-H1	W607075-11	N-Nitrosodi-n-butylamine	0.031	µg/tube	
16-06172-11-H1	W607075-11	N-Nitrosopiperidine	0.039	µg/tube	
16-06173-11-A1	W607075-14	N-Nitrosodiethylamine	0.069	µg/tube	C
16-06173-11-A1	W607075-14	N-Nitrosodimethylamine	0.088	µg/tube	
16-06173-11-A1	W607075-14	N-Nitrosomorpholine	0.046	µg/tube	
16-06173-11-A1	W607075-14	N-Nitrosopiperidine	0.046	µg/tube	
16-06173-11-H1	W607075-24	N-Nitrosodiethylamine	0.047	µg/tube	
16-06173-11-H1	W607075-24	N-Nitrosodimethylamine	0.372	µg/tube	
16-06173-11-H1	W607075-24	N-Nitrosomorpholine	0.052	µg/tube	
16-06173-11-H1	W607075-24	N-Nitrosopiperidine	0.042	μg/tube	

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco WA 93301 | 509.545.4989

16-06173-11-H1 W607075-24 N-Nitrosodimethylamine 0.017 µg/tube 16-06173-11-H1 W607075-24 N-Nitrosodi-n-propylamine 0.023 µg/tube

Recovery Failures in the ICV, CCV's, LCS, RL and MRL

There were no recovery failures in the: ICV, CCV, LCS, LCSD, There were recovery failures in the MRL.

RSD Failures in the LCS and LCSD's

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.

08/17/16

Scientist II DeNomy Dage

This report has been reviewed and approved by the following individual:

Franche Cincheire 08/18/16

Scientist I Fernanda Pincheira

If you have any questions, please feel free to contact DeNomy Dage at ddage@rjlg.com or at 509-545-4989.

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco WA 93301 | 509.545.4989

Washington River Protection

Carl Howald IV

Solutions, LLC

Laboratory Report

NIOSH 2522

Air/Emissions on GC/TEA Analyzer

Summary Table

RJ Lee Group No.: W607075 Samples Received: 07/26/16

> Report Date: 08/18/16 COC No.: 20162148

Extraction Date: 8/5/2016

P.O. Box 850 MSIN H6-16 Richland, WA 99352 Client Project: Cartridge Evaluation

Sample Identifica		Sampling	Analysis	Analyte	Concentration	RL	Qualifier
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06172-11-A1 S16T021811	W607075-01	07/22/16	08/05/16	N-Nitrosodimethylamine	0.416	0.014	
		07/22/16	08/08/16	N-Nitrosodimethylamine	0.043	0.016	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/08/16	N-Nitrosomethylethylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/08/16	N-Nitrosodiethylamine	< 0.020	0.020	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	0.052	0.021	
		07/22/16	08/08/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	0.024	0.022	1
		07/22/16	08/08/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/22/16	08/08/16	N-Nitrosopiperidine	< 0.020	0.020	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/08/16	N-Nitrosopyrrolidine	< 0.020	0.020	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	0.024	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	<0.022	0.022	
		07/22/16	08/08/16	N-Nitrosomorpholine	< 0.020	0.020	
16-06172-11-A2 S16T021812	W607075-02	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16		N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16		N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16		N-Nitrosopyrrolidine	<0.022	0.022	
		07/22/16		N-Nitrosomorpholine	<0.022	0.022	
teport Qualifiers: = Target Analyte media breakthrough suspect, see	analytical report		d = Data th	detected in the associated blank at exceeds the RSD criteria set by the SOP		1200	
a Analyte analyzed in a dilution a Report concentration was above the instrument a Analyte detected below quantitation limits, conce a Library spectrum match, rsd >90% w RT match a RPO (relative prevent difference) outside accept	entration is estimated		L = Sample Q = Result S = Spike R	e times for preparation or analysis execeded condition at receipt out of compliance with out of method specific acceptance QC eriter recovery outside accepted recovery limits AP accredited analyte	method defined conditions		
I = Analyte unalyzed for but not detected i/A = Not Applicable			ND = Not B				

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Sample Ident		Sampling	Analysis	Analyte	Concentration	RL	Qualifie
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06172-11-B1 S16T021813	W607075-03	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06172-11-BLANK S16T021814	W607075-04	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06172-11-C1 S16T021815	W607075-05	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16		N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06172-11-D1 S16T021816	W607075-06	07/22/16		N-Nitrosodimethylamine	< 0.014	0.014	
enter a contrata de la companio de la contrata de l	0.000	07/22/16		N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16		N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16		N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16		N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16		N-Nitrosomorpholine	< 0.022	0.022	
cyort Qualifiers: = Target Analyte media breakthrough suspect = Analyte analyzed in a dilution = Report concentration was above the instrue - Analyte detected below quantitation limits, = Library sysetrum match, sed >90% w RT v = RPD (relative prevent difference) outside at - Analyte analyzed for but not detected //A = Net Applicable	ment calibration range concentration is estimated natch		d = Data the H = Holding L = Sample Q = Result o S = Spike Re Z = Not EL ND = Not L	detected in the associated blank it exceeds the RSD criteria set by the SOP times for preparation or analysis exceeded amdition at receipt out of compliance with ut of method specific acceptance QC criteria exceep autistic accepted recovery limits WP accredited analyte betected attion analysis unavailable	nethod defined conditions		

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Sample Identificat Client Sample ID	ion RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration ug/tube	RL	Qualifier
16-06172-11-EL S16T021817	W607075-07	07/22/16	08/05/16	N-Nitrosodimethylamine	<0.014	0.014	-
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
6-06172-11-EFF-BASE S16T021818	W607075-08	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
6-06172-11-F1 S16T021819	W607075-09	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	<0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	<0.022	0.022	
6-06172-11-G1 S16T021820	W607075-10	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	<0.022	0.022	
port Qualifiers: = Target Analyte media breakthrough suspect, see a: = Analyte analyzed in a dilution Report concentration was above the instrument of Analyte detected below quantitation limits, conses = Library spectrum match, 13d >00% or RT match RPD (relative percent difference) outside accepted = Analyte analyzed for but not detected A Not Applicable	libration range tration is estimated		d = Dota the H = Holding L = Sample of Q = Result of S = Spike Re Z = Not ELI ND = Not D	detected in the associated blank executes the RSD criteria set by the SOP times for preparation or analysis exceeded andition at recipit out of compliance with a ut of method specific acceptance QC criteria covery outside accepted recovery limits effected.			

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Sample Ident		Sampling	Analysis	Analyte	Concentration	RL	Qualifier
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06172-11-H1 S16T021821	W607075-11	07/22/16	08/08/16	N-Nitrosodimethylamine	< 0.016	0.016	
		07/22/16	08/05/16	N-Nitrosodimethylamine	0.359	0.014	
		07/22/16	08/08/16	N-Nitrosomethylethylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	0.050	0.022	
		07/22/16	08/08/16	N-Nitrosodiethylamine	< 0.020	0.020	
		07/22/16	08/08/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/08/16	N-Nitrosodi-n-butylamine	0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	0.031	0.022	
		07/22/16	08/08/16	N-Nitrosopiperidine	< 0.020	0.020	
		07/22/16	08/05/16	N-Nitrosopiperidine	0.039	0.022	
		07/22/16	08/08/16	N-Nitrosopyrrolidine	< 0.020	0.020	
		07/22/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
		07/22/16	08/08/16	N-Nitrosomorpholine	< 0.020	0.020	
16-06172-11-H2 S16T021822	W607075-12	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16		N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16		N-Nitrosomorpholine	< 0.022	0.022	
16-06172-11-IN-BASE S16T021823	W607075-13	07/22/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/22/16		N-Nitrosomethylethylamine	< 0.022	0.022	
		07/22/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/22/16		N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/22/16		N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/22/16		N-Nitrosopiperidine	< 0.022	0.022	
		07/22/16		N-Nitrosopyrrolidine	< 0.022	0.022	
		07/22/16		N-Nitrosomorpholine	<0.022	0.022	
leport Qualifiers: = Target Analyte media broakthrough sospect = Analyte analyzed in a dilution = Report concentration was above the instru- = Analyte detected below quantitation limits, = Library systems match, red >90% w RT s = RPD (relative percent difference) outside as 1 Analyte analyzed for but not detected 1/4 = Not Applicable	ment calibration range concentration is estimated natch		d = Data thi H = Holding L = Sample: Q = Result o S = Spike Ra Z = Not EL ND = Not I	detected in the associated blank t exceeds the RSD criteria set by the SOP times for preparation or analysis exceeded omilition at recipi out of compliance with new to of method specific acceptance CC criteria except outside accepted recovery limits NP accredited analyte vecteded			

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Sample Identif		Sampling	Analysis	Analyte	Concentration	RL	Qualifier
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06173-11-A1 S16T021824	W607075-14	07/23/16	08/05/16	N-Nitrosodimethylamine	0.088	0.014	
		07/23/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosodiethylamine	0.069	0.022	C
		07/23/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosopiperidine	0.046	0.022	
		07/23/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosomorpholine	0.046	0.022	
16-06173-11-A2 S16T021825	W607075-15	07/23/16	08/05/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/05/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/05/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/05/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06173-11-B1 516T021826	W607075-16	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopiperidine	<0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06173-11-BLANK S16T021827	W607075-17	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.022	0.022	
eport Qualifiers: = Target Analyte media breakthrough suspect, = Analyte analyzed in a dilution = Report concentration was above the instrume Analyte detected below quantitation limits, or = Library spectrum match, rad >90% w RT ma = RPD (relative percent difference) outside acce = Analyte analyzed for but not detected	nt calibration range incentration is estimated teh		d = Data thi H = Holding L = Sample Q = Result o S = Spike Ro	detected in the associated blank t exceeds the RSD criteria set by the SOP times for preparation or analysis exceeded omilition at receipt out of compliance with nut of method systific acceptance QC criteria exceeds accepted recovery limits AP accredited analyte			

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Sample Identi		Sampling	Analysis	Analyte	Concentration	RL	Qualifier
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06173-11-C1 S16T021829	W607075-18	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06173-11-D1 S16T021830	W607075-19	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06173-11-E1 S16T021831	W607075-20	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.014	0.014	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopiperidine	<0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.022	0.022	
16-06173-11-EFF-BASE S16T021832	W607075-21	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.025	0.025	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.021	0.021	
eport Qualifiers: = Target Analyte media breakthrough suspect. = Analyte analyzed in a dilution = Report concentration was above the instrum = Analyte detected below quantitation limits, of = Library spectrum match, rsd > 80% w RT m = RPD (relative persent difference) outside acci = Analyte analyzed for but not detected	ent catibration range oncentration is estimated atch		d = Data thi H = Holding L = Sample Q = Result o S = Spike Ro	detected in the associated blank et exceeds the RSD criteria set by the SOP (times for preparation or analysis exceeded condition at receipt out of compliance with out of method specific acceptance QC criteria exceeding accepted recovery limits AP accredited analyte.	method defined conditions		

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Sample Ident		Sampling	Analysis	Analyte	Concentration	RL	Qualifie
Client Sample ID	RJLG ID	Date	Date		µg/tube		
16-06173-11-F1 S16T021833	W607075-22	07/23/16	08/06/16	N-Nitrosodimethylamine	<0.025	0.025	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.021	0.021	
6-06173-11-G1 S16T021834	W607075-23	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.025	0.025	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosomorpholine	< 0.021	0.021	
16-06173-11-H1 S16T021835	W607075-24	07/23/16	08/08/16	N-Nitrosodimethylamine	0.017	0.016	
		07/23/16	08/06/16	N-Nitrosodimethylamine	0.372	0.025	
		07/23/16	08/08/16	N-Nitrosomethylethylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/08/16	N-Nitrosodiethylamine	< 0.020	0.020	
		07/23/16	08/06/16	N-Nitrosodiethylamine	0.047	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16		N-Nitrosodi-n-propylamine	0.023	0.021	
		07/23/16	08/08/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/08/16	N-Nitrosopiperidine	< 0.020	0.020	
		07/23/16	08/06/16	N-Nitrosopiperidine	0.042	0.022	
		07/23/16	08/08/16	N-Nitrosopyrrolidine	< 0.020	0.020	
		07/23/16		N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16		N-Nitrosomorpholine	0.052	0.021	
		07/23/16	08/08/16	N-Nitrosomorpholine	< 0.020	0.020	
poet Qualifiers: = Target Analyte media breakthrough suspec = Analyte enalgeed in a dilution = Report concentration was above the instru Analyte detected below quantitation limits, = Library spectrum match, red > 90% in RT = RPD (relative percent difference) ontside a = Analyte analyzed for but not detected	ment calibration range concentration is estimated natch		d = Data thi H = Holding L = Sample Q = Result o S = Spike Ro	detected in the associated blank t exceeds the RSD criteria set by the SOP times for preparation or analysis exceeded undition at receipt out of compliance with out of method specific acceptance QC criteria exceeding an accepted recovery limits AP accredited analyte elected	method defined conditions		

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Sample Identification Client Sample ID RJLG II		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifier
16-06173-11-H2 S16T021836	W607075-25	07/23/16	08/06/16	N-Nitrosodimethylamine	<0.025	0.025	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16		N-Nitrosomorpholine	< 0.021	0.021	
16-06173-11-IN-BASE \$16T021837	W607075-26	07/23/16	08/06/16	N-Nitrosodimethylamine	< 0.025	0.025	
		07/23/16	08/06/16	N-Nitrosomethylethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodiethylamine	< 0.022	0.022	
		07/23/16	08/06/16	N-Nitrosodi-n-propylamine	< 0.021	0.021	
		07/23/16	08/06/16	N-Nitrosodi-n-butylamine	< 0.021	0.021	
		07/23/16		N-Nitrosopiperidine	< 0.022	0.022	
		07/23/16		N-Nitrosopyrrolidine	< 0.022	0.022	
		07/23/16		N-Nitrosomorpholine	< 0.021	0.021	
eport Qualifiers:				detected in the associated blank			
= Target Analyte media breakthrough suspect, see analytical r	eport		The state of the s	it exceeds the RSD criteria set by the SOP			
) = Analyte analyzed in a dilution			H = Holding	times for preparation or analysis exceeded			
= Report concentration was above the instrument calibration to			L = Sample of	condition at receipt out of compliance with	method defined conditions		
 Analyte detected below quantitation limits, concentration is 	estimated		Q = Result of	out of method specific acceptance QC criteri	ar .		
= Library spectrum match, rsd >90% w RT match			S = Spike Re	xovery outside accepted recovery limits			
= RPD (relative percent difference) outside accepted recovery	limits		Z = Not EL	AP accredited analyte			

ND = Not Detected

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U = Analyte enalyzed for but not detected

N/A = Not Applicable

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard correnty and limitation of liability procisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report. RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling for will be assessed for the return of any samples. Unless otherwise noted, samples were received in an acceptable condition. This laboratory operates in accordance with ISO 17025 guidelines, and holds limited scopes of accreditation under ORELAP Lab Code 4061 AIHA-LAP, LLC Lab ID 178505 EPA ID WAD1195 and WA DOE Lab ID C859. This report may not be used to claim product endorsoment by any laboratory accrediting agency. The results contained in this report relate only to the items tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid. Quality control data is available upon request.

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Carl Howald IV

Quality Control

NIOSH 2522

RJ Lee Group No.: W607075 Samples Received: 07/26/16 Report Date: 08/18/16 COC No.: 20162148 Extraction Date: 8/5/2016

Washington River Protection Solutions, LLC P.O. Box 850 MSIN H6-16 Richland, WA 99352

Client Project: Cartridge Evaluation

Analyte	CAS No.	Sample ID	Analyzed Date	Expected µg/tube	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	LCS1	08/05/16	0.200	0.188	0.93	0.203	101	1.14	
N-Nitrosodiethylamine	55-18-5	LCS1	08/06/16	0.200	0.184	0.92	0.200	99.8	0.343	
N-Nitrosodiethylamine	55-18-5	LCS1	08/08/16	0.200	0.193	0.98	0.196	97.9	1.95	
N-Nitrosodimethylamine	62-75-9	LCS1	08/05/16	0.200	0.182	0.89	0.206	103	2.53	
N-Nitrosodimethylamine	62-75-9	LCS1	08/06/16	0.200	0.166	0.80	0.206	103	2.79	
N-Nitrosodimethylamine	62-75-9	LCS1	08/08/16	0.200	0.184	0.94	0.195	97.4	3.45	
N-Nitrosodi-n-butylamine	924-16-3	LCS1	08/05/16	0.200	0.182	0.91	0.200	99.6	1.73	
N-Nitrosodi-n-butylamine	924-16-3	LCS1	08/06/16	0.200	0.195	0.97	0.201	100	0.547	
N-Nitrosodi-n-butylamine	924-16-3	LCS1	08/08/16	0.200	0.191	0.96	0.200	99.7	1.20	
N-Nitrosodi-n-propylamine	621-64-7	LCS1	08/05/16	0.200	0.187	0.94	0.199	98.9	2.54	
N-Nitrosodi-n-propylamine	621-64-7	LCS1	08/06/16	0.200	0.195	0.97	0.201	100	0.120	
N-Nitrosodi-n-propylamine	621-64-7	LCS1	08/08/16	0.200	0.193	0.97	0.200	100	0.667	
N-Nitrosomethylethylamine	10595-95-6	LCS1	08/05/16	0.200	0.182	0.91	0.200	100	1.06	
N-Nitrosomethylethylamine	10595-95-6	LCS1	08/06/16	0.200	0.177	0.89	0.198	98.8	1.21	
N-Nitrosomethylethylamine	10595-95-6	LCS1	08/08/16	0.200	0.192	0.97	0.197	98.5	1.92	
N-Nitrosomorpholine	59-89-2	LCS1	08/05/16	0.200	0.186	0.93	0.200	100	0.891	
N-Nitrosomorpholine	59-89-2	LCS1	08/06/16	0.200	0.189	0.95	0.198	99.0	0.927	
N-Nitrosomorpholine	59-89-2	LCS1	08/08/16	0.200	0.195	0.99	0.198	99.0	2.53	
N-Nitrosopiperidine	100-75-4		08/05/16	0.200	0.183	0.91	0.201	99.9	0.890	
N-Nitrosopiperidine	100-75-4	LCS1	08/06/16	0.200	0.179	0.91	0.197	98.4	1.53	
N-Nitrosopiperidine	100-75-4	LCS1	08/08/16	0.200	0.195	0.98	0.199	99.1	1.56	
N-Nitrosopyrrolidine	930-55-2	LCS1	08/05/16	0.200	0.182	0.92	0.198	99.3	2.11	
N-Nitrosopyrrolidine	930-55-2	LCS1	08/06/16	0.200	0.185	0.91	0.202	101	1.29	
N-Nitrosopyrrolidine	930-55-2	LCS1	08/08/16	0.200	0.193	0.98	0.198	98.9	1.05	
N-Nitrosodiethylamine	55-18-5	LCS2	08/05/16	0.200	0.185	0.93	0.199	99.7	1.14	
N-Nitrosodiethylamine	55-18-5	LCS2	08/06/16	0.200	0.184	0.92	0.200	99.8	0.343	
N-Nitrosodiethylamine	55-18-5	LCS2	08/08/16	0.200	0.201	0.98	0.204	102	1.95	
N-Nitrosodimethylamine	62-75-9	LCS2	08/05/16	0.200	0.177	0.89	0.200	99.7	2.53	
N-Nitrosodimethylamine	62-75-9	LCS2	08/06/16	0.200	0.160	0.80	0.199	99.0	2.79	
N-Nitrosodimethylamine	62-75-9	LCS2	08/08/16	0.200	0.196	0.94	0.208	104	3.45	
N-Nitrosodi-n-butylamine	924-16-3	1000000000	08/05/16	0.200	0.186	0.91	0.204	102	1.73	
N-Nitrosodi-n-butylamine	924-16-3		08/06/16	0.200	0.193	0.97	0.199	99.4	0.547	
N-Nitrosodi-n-butylamine	924-16-3	LCS2	08/08/16	0.200	0.194	0.96	0.203	101	1.20	
N-Nitrosodi-n-propylamine	621-64-7	LCS2	08/05/16	0.200	0.194	0.94	0.206	103	2.54	
N-Nitrosodi-n-propylamine	621-64-7		08/06/16	0.200	0.195	0.97	0.201	100	0.120	

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected µg/tube	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodi-n-propylamine	621-64-7	LCS2	08/08/16	0.200	0.195	0.97	0.202	101	0.667	
N-Nitrosomethylethylamine	10595-95-6	LCS2	08/05/16	0.200	0.184	0.91	0.202	101	1.06	
N-Nitrosomethylethylamine	10595-95-6	LCS2	08/06/16	0.200	0.179	0.89	0.201	99.9	1.21	
N-Nitrosomethylethylamine	10595-95-6	LCS2	08/08/16	0.200	0.199	0.97	0.204	102	1.92	
N-Nitrosomorpholine	59-89-2	LCS2	08/05/16	0.200	0.187	0.93	0.201	101	0.891	
N-Nitrosomorpholine	59-89-2	LCS2	08/06/16	0.200	0.191	0.95	0.201	100	0.927	
N-Nitrosomorpholine	59-89-2	LCS2	08/08/16	0.200	0.203	0.99	0.206	103	2.53	
N-Nitrosopiperidine	100-75-4		08/05/16	0.200	0.184	0.91	0.202	101	0.890	
N-Nitrosopiperidine	100-75-4	LCS2	08/06/16	0.200	0.184	0.91	0.203	101	1.53	
N-Nitrosopiperidine	100-75-4		08/08/16	0.200	0.200	0.98	0.204	102	1.56	
N-Nitrosopyrrolidine	930-55-2	LCS2	08/05/16	0.200	0.188	0.92	0.205	102	2.11	
N-Nitrosopyrrolidine	930-55-2	LCS2	08/06/16	0.200	0.184	0.91	0.201	100	1.29	
N-Nitrosopyrrolidine	930-55-2		08/08/16	0.200	0.197	0.98	0.202	101	1.05	
N-Nitrosodiethylamine	55-18-5		08/05/16	0.200	0.184	0.93	0.198	99.1	1.14	
N-Nitrosodiethylamine	55-18-5		08/06/16	0.200	0.185	0.92	0.201	100	0.343	
N-Nitrosodiethylamine	55-18-5		08/08/16	0.200	0.198	0.98	0.201	100	1.95	
N-Nitrosodimethylamine	62-75-9	4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	08/05/16	0.200	0.173	0.89	0.195	97.6	2.53	
N-Nitrosodimethylamine	62-75-9		08/06/16	0.200	0.158	0.80	0.196	97.8	2.79	
N-Nitrosodimethylamine	62-75-9		08/08/16	0.200	0.186	0.94	0.198	98.7	3.45	
N-Nitrosodi-n-butylamine	924-16-3		08/05/16	0.200	0.180	0.91	0.198	98.5	1.73	
N-Nitrosodi-n-butylamine	924-16-3		08/06/16	0.200	0.195	0.97	0.201	100	0.547	
N-Nitrosodi-n-butylamine	924-16-3	LCS3	08/08/16	0.200	0.190	0.96	0.198	99.0	1.20	
N-Nitrosodi-n-propylamine	621-64-7		08/05/16	0.200	0.185	0.94	0.196	98.2	2.54	
N-Nitrosodi-n-propylamine	621-64-7		08/06/16	0.200	0.194	0.97	0.200	99.9	0.120	
N-Nitrosodi-n-propylamine	621-64-7		08/08/16	0.200	0.192	0.97	0.199	99.3	0.667	
N-Nitrosomethylethylamine	10595-95-6		08/05/16	0.200	0.180	0.91	0.198	98.9	1.06	
N-Nitrosomethylethylamine	10595-95-6	LCS3	08/06/16	0.200	0.181	0.89	0.203	101	1.21	
N-Nitrosomethylethylamine	10595-95-6	LCS3	08/08/16	0.200	0.194	0.97	0.199	99.3	1.92	
N-Nitrosomorpholine	59-89-2	1000000	08/05/16	0.200	0.184	0.93	0.198	99.0	0.891	
N-Nitrosomorpholine	59-89-2		08/06/16	0.200	0.192	0.95	0.202	101	0.927	
N-Nitrosomorpholine	59-89-2		08/08/16	0.200	0.194	0.99	0.197	98.2	2.53	
N-Nitrosopiperidine	100-75-4		08/05/16	0.200	0.181	0.91	0.198	99.1	0.890	
N-Nitrosopiperidine	100-75-4	LCS3	08/06/16	0.200	0.182	0.91	0.201	100	1.53	
N-Nitrosopiperidine	100-75-4	LCS3	08/08/16	0.200	0.194	0.98	0.198	99.1	1.56	
N-Nitrosopyrrolidine	930-55-2	LCS3	08/05/16	0.200	0.181	0.92	0.197	98.3	2.11	
N-Nitrosopyrrolidine	930-55-2		08/06/16	0.200	0.180	0.91	0.197	98.5	1.29	
N-Nitrosopyrrolidine	930-55-2		08/08/16	0.200	0.196	0.98	0.201	100	1.05	
N-Nitrosodiethylamine	55-18-5	MB	08/05/16	- A - 12743 5	0.00	0.93	0.00			
N-Nitrosodiethylamine	55-18-5	MB	08/06/16		0.00	0.92	0.00			
N-Nitrosodiethylamine	55-18-5		08/08/16		0.00	0.98	0.00			
N-Nitrosodimethylamine	62-75-9		08/05/16		0.00	0.89	0.00			
N-Nitrosodimethylamine	62-75-9		08/06/16		0.00	0.80	0.00			

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected µg/tube	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodimethylamine	62-75-9	МВ	08/08/16		0.00	0.94	0.00	_	_	
N-Nitrosodi-n-butylamine	924-16-3	МВ	08/05/16		0.00	0.91	0.00			
N-Nitrosodi-n-butylamine	924-16-3	МВ	08/06/16		0.00	0.97	0.00			
N-Nitrosodi-n-butylamine	924-16-3	МВ	08/08/16		0.00	0.96	0.00			
N-Nitrosodi-n-propylamine	621-64-7	МВ	08/05/16		0.00	0.94	0.00			
N-Nitrosodi-n-propylamine	621-64-7	МВ	08/06/16		0.00	0.97	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	08/08/16		0.00	0.97	0.00			
N-Nitrosomethylethylamine	10595-95-6	МВ	08/05/16		0.00	0.91	0.00			
N-Nitrosomethylethylamine	10595-95-6	МВ	08/06/16		0.00	0.89	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	08/08/16		0.00	0.97	0.00			
N-Nitrosomorpholine	59-89-2	МВ	08/05/16		0.00	0.93	0.00			
N-Nitrosomorpholine	59-89-2	МВ	08/06/16		0.00	0.95	0.00			
N-Nitrosomorpholine	59-89-2		08/08/16		0.00	0.99	0.00			
N-Nitrosopiperidine	100-75-4		08/05/16		0.00	0.91	0.00			
N-Nitrosopiperidine	100-75-4		08/06/16		0.00	0.91	0.00			
N-Nitrosopiperidine	100-75-4		08/08/16		0.00	0.98	0.00			
N-Nitrosopyrrolidine	930-55-2	МВ	08/05/16		0.00	0.92	0.00			
N-Nitrosopyrrolidine	930-55-2	МВ	08/06/16		0.00	0.91	0.00			
N-Nitrosopyrrolidine	930-55-2		08/08/16		0.00	0.98	0.00			
N-Nitrosodiethylamine	55-18-5		08/05/16	0.020	0.021	0.93	0.023	114		
N-Nitrosodiethylamine	55-18-5		08/06/16	0.020	0.024	0.92	0.026	129		
N-Nitrosodiethylamine	55-18-5	MRL	08/08/16	0.020	0.026	0.98	0.026	130		
N-Nitrosodimethylamine	62-75-9	NAME OF TAXABLE PARTY.	08/05/16	0.020	0.023	0.89	0.026	130		
N-Nitrosodimethylamine	62-75-9		08/06/16	0.020	0.019	0.80	0.024	120		
N-Nitrosodimethylamine	62-75-9		08/08/16	0.020	0.025	0.94	0.027	134		
N-Nitrosodi-n-butylamine	924-16-3		08/05/16	0.020	0.025	0.91	0.028	141		
N-Nitrosodi-n-butylamine	924-16-3	MRL	08/06/16	0.020	0.026	0.97	0.027	135		
N-Nitrosodi-n-butylamine	924-16-3	CONTRACTOR OF	08/08/16	0.020	0.025	0.96	0.026	129		
N-Nitrosodi-n-propylamine	621-64-7	MRL	08/05/16	0.020	0.023	0.94	0.024	121		
N-Nitrosodi-n-propylamine	621-64-7		08/06/16	0.020	0.026	0.97	0.027	137		
N-Nitrosodi-n-propylamine	621-64-7		08/08/16	0.020	0.025	0.97	0.026	129		
N-Nitrosomethylethylamine	10595-95-6		08/05/16	0.020	0.023	0.91	0.025	126		
N-Nitrosomethylethylamine	10595-95-6	MRL	08/06/16	0.020	0.023	0.89	0.026	128		
N-Nitrosomethylethylamine	10595-95-6	MRL	08/08/16	0.020	0.025	0.97	0.026	131		
N-Nitrosomorpholine	59-89-2	MRL	08/05/16	0.020	0.024	0.93	0.026	128		
N-Nitrosomorpholine	59-89-2		08/06/16	0.020	0.026	0.95	0.027	136		
N-Nitrosomorpholine	59-89-2		08/08/16	0.020	0.024	0.99	0.024	119		
N-Nitrosopiperidine	100-75-4		08/05/16	0.020	0.022	0.91	0.024	118		
N-Nitrosopiperidine	100-75-4		08/06/16	0.020	0.023	0.91	0.025	126		
N-Nitrosopiperidine	100-75-4		08/08/16	0.020	0.026	0.98	0.027	133		
N-Nitrosopyrrolidine	930-55-2		08/05/16	0.020	0.025	0.92	0.027	137		
N-Nitrosopyrrolidine	930-55-2		08/06/16	0.020	0.026	0.91	0.028	138		

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected µg/tube		DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MRL	08/08/16	0.020	0.023	0.98	0.024	118		

Report Qualifiers:

 $A = Target\ Analyte\ media\ breakthrough\ suspect,\ see\ analytical\ report$

D = Analyte analyzed in a dilution

 $E = Report\ concentration\ was\ above\ the\ instrument\ calibration\ range$

] = Analyte detected below quantitation limits, concentration is estimated P = Library spectrum match, rsd >90% w RT match

 $R = RPD \ (relative \ percent \ difference) \ outside \ accepted \ recovery \ limits \\ U = Analyte \ analyte d \ for but \ not \ detected$

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

 ${\cal H}={\cal H}olding\ times\ for\ preparation\ or\ analysis\ exceeded$

$$\label{eq:local_local_local} \begin{split} L &= Sample \ condition \ at \ receipt \ out \ of \ compliance \ with \ method \ defined \ conditions \\ Q &= Result \ out \ of \ method \ specific \ acceptance \ QC \ criteria \end{split}$$

S = Spike Recovery outside accepted recovery limits Z = Not ELAP accredited analyte

ND = Not Detected

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AlHA-LAP, LLC Lab ID 178656 EPA ID WA01195 and WA DOE Lab ID C859. 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 tested or to the sample's) as received by the laboratory. Any reproduction of this document must be in full for the report to be

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Assembler N/A					 오	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	IALYSIS REQUEST	C.O.C. No. 20162148	148
								Page 1	of 3
Collector					CARL HOWALD IV	stor V	Telephone No 373-6861	MSIN FAX 37	372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	LUATION	Purchase Order/Charge Code 202003/CB20		
Project Title CARTRIDGE EVALUATION	UATION				Logbook/ Work Package No.	Package No.	loe Chest No.	Temp.	
Shipped To (Lab)	٥				Method of Shipment	ment	Bill of Lading/Air Bill No.		
Protocol N/A				J	Data Turnaround	nd	Parts and Return No.		
Sample No.	Lab ID	•	Date	Time	No./Type Container		Sample Analysis		Preservative
	S16T021811	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-Al			A/N
	\$167021812	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-A2 . V			A/N
	S16T021813	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-B1			W/N
	S16T021814	VA.	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-BLANK	<		W/N
	S16T021815	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-C1 . <			N/N
	S16T021816	V.A.	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-01 - /			A/N
	S16T021817	V.	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-E1 (/	,		W/W
	S16T021818	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-EFF-BASE	. <		W/N
	S16T021819	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-F1 \			A/N
	S16T021820	VA	7/22/16		Thermosorb-N	Nitrosamines 16-06172-11-G1 · V	3		W/N
POSSIBLE SAN	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	REMAR	kKS (List all k	nown waste	MSDS O	Yes O No SPECIAL INSTRUCTIONS Send Results to Carl Robert W Sesagrljov see Sow For email	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Robert W Soss@fl.gov and Greg_S_Moore@fl.gov see SOW for email	Hold Time	
Delinguished By							Datedina		
Sharen Lyolder	- Holder	2	J. Muh	17.20	8	Received By Print Sign	1	Matrix*	= Drum Liquids
Relinquished By		Da	540	616	11 SO Date/Time	RICE RILEE	SROUP 7/26/16 11:5/So Sate/Time W	= Solid WI = Sludge L = Water V	= Wipe = Liquid = Vegetation = Vapor
Relinquished By					Date/Time	Received By	Date/Time A DS	= Drum Solids	Cine
FINAL SAMPLE DISPOSITION	Disposal Method (e.g	(e.g., F	teturn to custo	omer, per la	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	in process) Disposed By		Date/Time 08 15 16 12:27	בי

Relinquished By Print Aure Libe (&a- Relinquished By Relinquished By Relinquished By Relinquished By Relinquished By Relinquished By	8	belde	No (de			POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	S16T021831	S16T021830	S16T021829	S16T021827	\$16T021826	S16T021825	\$167021824	\$16T021823	\$16T021822	S16T021821	Sample No. Lab ID	Protocol N/A	Shipped To (Lab)	Project Title CARTRIDGE EVALUATION	SAF No.	Collector JONES	N/A	
ethod (e.g.		Silve	2	nt		RDS/REM	831 V	1000			326 VA	325 VA	324 VA				ō							
., Return to ci			X	Sign		ARKS (List a	VA 7/23/16	VA 7/23/16	VA 7/23/16	VA 7/23/16	A 7/23/16	A 7/23/16	A 7/23/16	VA 7/22/16	VA 7/22/16	VA 7/22/16	• Date							
stomer, per			7-26	W 73		Il known was		150								1	Time							
Date/Time Received By Date/Time Received By Date/Time Received By Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Date/Time	8		MSDS O	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	No./Type Container	Data Turnaround	Method of Shipment	Logbook/ Work Package No.	Sample Origin CARTRIDGE EVALUATION	Carl Howald IV	오	
in process)		Received By	Received By	rok	20 C)	Yes No S	Nitrosamines 16-06173-11-E1	Nitrosamines 16-06173-11-01	Nitrosamines 16-06173-11-C1	Nitrosamines 1	Nitrosamines 16-06173-11-81	Nitrosamines 16-06173-11-A2	Nitrosamines 16-06173-11-Al	Nitrosamines 1	Nitrosamines 16-06172-11-H2	Nitrosamines 16-06172-11-H1	Br .	nd	ment	Package No.	LUATION	stor ¥	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	MGO
Disposed By			RICE RILEE	Print Sign	CONTRACT 55503 RELEASE 5	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Robert W Sosa@f1.gov and Greg_S_Moore@f1.gov see SOW for email	16-06173-11-E1	16-06173-11-D1	16-06173-11-C1	Nitrosamines 16-06173-11-BLANK	L6-06173-11-B1	L6-06173-11-A2	6-06173-11-A1	Nitrosamines 16-06172-11-IN-BASE	16-06172-11-н2	16-06172-11-Н1							ODY/SAMPL	SL0200M
			E GROUP 7	0 7361C		Carl Howald IV	4	4	1	NX - V	-(,	Š	BASE /	,	ζ	Sample Analysis	Parts	Bill of	loe Ct	Purch 20200	Telep	E ANALYSIS	
		Date/Time	24/16 1150 Date/Time	Date/Time		& Greg Moore S Moore@rl.gov											sis	Parts and Return No.	Bill of Lading/Air Bill No.	loe Chest No.	Purchase Order/Charge Code 202003/CB20	Telephone No 373-6861	REQUEST	
		O)	o ≤ & & &	S = Soil																				5
Date/Time		m Solids	er og	Matrix* il DL DL		Hold Time														Temp.		MSIN FAX	201	
me		= Other	M = Wipe L = Liquid V = Vegetation VA = Vapor	11 11			N/A	N/A	N/A	N/A	N/N	N/A	N/A	N/A	N/N	N/A	Preservative					372-1878	162148 2 of 3	

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Assembler		1		ŀ		M(601018)		C.O.C. No.	
N/A					СН	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	QUEST	20162148 Page 3 of	.62148 3 of 3
Collector					Contact/Requestor	or Telephone No ₃₇₃₋₆₈₆₁		MSIN FAX	372
SAF No.		П			Sample Origin		Code		
Project Title CARTRIDGE EVALUATION	UATION				Logbook/ Work Package No.	No.		Temp.	
Shipped To (Lab)	b)				Method of Shipment	ent Bill of Lading/Air Bill No.	Air Bill No.		
Protocol N/A					Data Turnaround	Parts and Return No.	um No.		
Sample No.	Lab ID	•	Date	Time	No./Type Container	Sample Analysis			Preservative
	S16T021832	γγ	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-EFF-BASE			N/A
	S16T021833	VΑ	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-F1 · ·			N/N
	S16T021834	VA.	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-G1 '			N/A
	S16T021835	V.	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-H1 \			A/N
	S16T021836	VΆ	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-H2 ,			A/N
	\$167021837	VA	7/23/16		Thermosorb-N	Nitrosamines 16-06173-11-IN-BASE ,			N/A
POSSIBLE SAI	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	EMAR	KS (List all kr	nown wast	es) MSDS () Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Robert W 50sa@rl.gov and Greg_S_Moore@rl.gov see Som Tor email CONTRACT 55503 RELEASE 5	reerl.gov	Hold Time	
Relinquished By	Wolder 1	12	Sign	Ld 7.21.16	OS 200 e/Time	Received By Print Sign Do	Date/Time SE	Matrix* = Soil DL = Sediment T	x* L = Drum Liquids = Tissue
RE Kesyass Relinquished By	es A	W.	4	12616		T. RICE RILEE GROUP 7/26	o ≤ k &		If an access
Relinquished By	Y				Date/Time R	Received By D		= Drum Solids	= Omer
FINAL SAMPLE DISPOSITION	Disposal Method (gosume	eturn to custo	mer, per l	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	process) Disposed By		Date/Time Date/Time	me (2:27)
All samples con	taining hazardous	materia	ils shall be pi	cked up by	requestor and return	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A	A-6003-962 (03/05)

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 using their molecular weights and corresponding flow rates after volume correction¹⁷ as shown in the following equation:

$$C = 24.45 \frac{r}{M V}$$

where C is the concentration of COPC in ppmv; r is the analytical result with units of μ g/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 with unit of g/mol. When the ratio between concentration and the corresponding 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 $T_{standard}/T_{upstream}$.

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 (Pupstream, 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 in 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 $(P_{upstream} - P_{tube}) \div P_{standard}$.

 $^{^{17}}$ Based on the standard temperature and pressure condition of P = 101325 Pa, R = 8.314 J/(mol.K), and T = 298.15 K.

For measurements made at the outlet of the respirator cartridge the pressure correction factor is $(P_{upstream} - P_{cartridge} - P_{tube}) \div P_{standard}$.

Tube Location	First Measure (inches of WC, tube on cartridge inlet	Second Measure (inches of WC, tube on cartridge	Average of Both Measurements (P _{tube} , inches of WC)
	side)	outlet side)	
A	5.0	12.4	8.7
В	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
Н	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 of calculating the correction factors is as follows. For a given time period assume that the reported upstream pressure ($P_{upstream}$) was 734 Torr and the corresponding temperature ($T_{upstream}$) was 85.9F (or 302.9K). 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 is 0.944. When multiplied, these two factors equal 0.929 which would be the overall correction to the reported volume measurement.

- 5. 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 detection limit 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.
 - 1. For ammonia and mercury, only the results obtained from using method of total vapor of ammonia and mercury were used.
 - 2. For furan, results from furan tube instead of Carbotrap 300 TDU were used. For acetonitrile, results from the Carbotrap 300 TDU tube were used.
 - 3. For N-Nitrosdiemethylamine (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 measurement. This same rule applies to 1, 3-Butadiene. The results in the plots and tables reflect the 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 OEL) range. COPCs with these highlights (only) are plotted and shown in Appendix E.

The position numbers that start with 6172 are for the SCOTT 7422-SD1 model of cartridge and the position numbers that start with 6173 are for the SCOTT 7422-SC1 model of cartridge.

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
1	Ammonia	2	6172-A1	121	2.50E+01	484%	\ DL:	2.55%
1	Ammonia	16	6172-H1	121	2.50E+01	484%		2.55%
1	Ammonia	2	6172-A2	0.62	2.50E+01	2.48%	YES	2.55%
1	Ammonia	4	6172-B1	7.6	2.50E+01	30.3%		2.55%
1	Ammonia	6	6172-C1	63	2.50E+01	253%		2.55%
1	Ammonia	8	6172-D1	11	2.50E+01	43.7%		2.55%
1	Ammonia	10	6172-E1	72	2.50E+01	289%		2.55%
1	Ammonia	12	6172-F1	87	2.50E+01	348%		2.55%
1	Ammonia	14	6172-F1	18	2.50E+01	72.4%		2.55%
1	Ammonia	16	6172-G1 6172-H2	0.61	2.50E+01	2.44%	YES	2.55%
					2.50E+01 2.50E+01		TES	
1	Ammonia	2	6173-A1	111		442%		2.55%
1	Ammonia	16	6173-H1	48	2.50E+01	192%	VEC	2.55%
1	Ammonia	2	6173-A2	0.62	2.50E+01	2.50%	YES	2.55%
1	Ammonia	4	6173-B1	0.64	2.50E+01	2.55%	YES	2.55%
1	Ammonia	6	6173-C1	0.64	2.50E+01	2.54%	YES	2.55%
1	Ammonia	8	6173-D1	2.0	2.50E+01	7.89%		2.55%
1	Ammonia	10	6173-E1	3.4	2.50E+01	13.4%		2.55%
1	Ammonia	12	6173-F1	0.64	2.50E+01	2.55%	YES	2.55%
1	Ammonia	14	6173-G1	78	2.50E+01	314%		2.55%
1	Ammonia	16	6173-H2	5.1	2.50E+01	20.3%		2.55%
3	Mercury	2	6172-A1	0.0009	3.00E-03	31.5%		7.38%
3	Mercury	16	6172-H1	0.0009	3.00E-03	29.6%		7.38%
3	Mercury	2	6172-A2	0.0002	3.00E-03	7.11%	YES	7.38%
3	Mercury	4	6172-B1	0.0002	3.00E-03	7.27%	YES	7.38%
3	Mercury	6	6172-C1	0.0002	3.00E-03	6.83%	YES	7.38%
3	Mercury	8	6172-D1	0.0002	3.00E-03	7.31%	YES	7.38%
3	Mercury	10	6172-E1	0.0002	3.00E-03	7.14%	YES	7.38%
3	Mercury	12	6172-F1	0.0002	3.00E-03	7.03%	YES	7.38%
3	Mercury	14	6172-G1	0.0002	3.00E-03	7.02%	YES	7.38%
3	Mercury	16	6172-H2	0.0002	3.00E-03	7.00%	YES	7.38%
3	Mercury	2	6173-A1	0.0010	3.00E-03	32.0%		7.38%
3	Mercury	16	6173-H1	0.001	3.00E-03	33.8%		7.38%
3	Mercury	2	6173-A2	0.0002	3.00E-03	7.11%	YES	7.38%
3	Mercury	4	6173-A2	0.0002	3.00E-03	7.22%	YES	7.38%
3	Mercury	6	6173-C1	0.0002	3.00E-03	7.26%	YES	7.38%
3		8						
	Mercury		6173-D1	0.0002	3.00E-03	7.38%	YES	7.38%
3	Mercury	10	6173-E1	0.0002	3.00E-03	7.26%	YES	7.38%
3	Mercury	12	6173-F1	0.0002	3.00E-03	7.23%	YES	7.38%
3	Mercury	14	6173-G1	0.0002	3.00E-03	7.15%	YES	7.38%
3	Mercury	16	6173-H2	0.0002	3.00E-03	6.98%	YES	7.38%
4	1,3-Butadiene	2	6172-A1	0.019	1.00E+00	1.95%	YES	2.44%
4	1,3-Butadiene	16	6172-H1	0.020	1.00E+00	1.97%	YES	2.44%
4	1,3-Butadiene	2	6172-A2	0.020	1.00E+00	1.98%	YES	2.44%
4	1,3-Butadiene	4	6172-B1	0.024	1.00E+00	2.44%		2.44%
4	1,3-Butadiene	6	6172-C1	0.019	1.00E+00	1.94%		2.44%
4	1,3-Butadiene	8	6172-D1	0.024	1.00E+00	2.38%		2.44%
4	1,3-Butadiene	10	6172-E1	0.020	1.00E+00	1.97%	YES	2.44%
4	1,3-Butadiene	12	6172-F1	0.020	1.00E+00	1.99%	YES	2.44%
4	1,3-Butadiene	14	6172-G1	0.020	1.00E+00	1.96%	YES	2.44%
4	1,3-Butadiene	16	6172-H2	0.019	1.00E+00	1.94%	YES	2.44%
4	1,3-Butadiene	2	6173-A1	0.020	1.00E+00	1.98%	YES	2.64%
4	1,3-Butadiene	16	6173-H1	0.020	1.00E+00	1.97%	YES	2.64%
4	1,3-Butadiene	2	6173-A2	0.026	1.00E+00	2.64%	YES	2.64%
4	1,3-Butadiene	4	6173-B1	0.020	1.00E+00	2.01%	YES	2.64%
4	1,3-Butadiene	6	6173-C1	0.020	1.00E+00	2.00%	YES	2.64%
4	1,3-Butadiene	8	6173-C1 6173-D1	0.020	1.00E+00	2.01%	YES	2.64%
4	1,3-Butadiene	10		0.020		2.03%	YES	2.64%
4			6173-E1		1.00E+00			
7.1	1,3-Butadiene	12	6173-F1	0.020	1.00E+00	2.00%	YES	2.64%
4	1,3-Butadiene	14	6173-G1	0.020	1.00E+00	2.00%	YES	2.64%

Separate 2 6172-A1 0.0007 5.00E-01 0.133% 0.03%	COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement	Approx. DL
Seminarian	3010#	Allalyte	end time (ii)	7 03/2/011	conc. (ppm)	OLE (ppin)	. raction of OEL	< DL?	(%OEL)
Seminarian	5	Benzene	2	6172-A1	0.0007	5.00E-01	0.133%		0.03%
Separate	5	Benzene	16	6172-H1	0.0006	5.00E-01	0.122%		0.03%
Separate	5	Benzene	2	6172-A2	0.0001	5.00E-01	0.026%	YES	0.03%
Separate	5	Benzene	4	6172-B1	0.0002	5.00E-01	0.030%		0.03%
Seminarie 10 6172-E1 0.0001 5.006-01 0.028% 0.03%	5	Benzene	6	6172-C1	0.0002	5.00E-01	0.031%		0.03%
5 Benzene	5	Benzene	8	6172-D1	0.0002	5.00E-01	0.031%		0.03%
Semene	5	Benzene	10	6172-E1	0.0001	5.00E-01	0.028%		0.03%
Semzene	5	Benzene	12	6172-F1	0.0001	5.00E-01	0.026%		0.03%
Sentence 2 6173-A1 0.0005 5.006-01 0.108% 0.03%	5	Benzene	14	6172-G1	0.0001	5.00E-01	0.025%		0.03%
5 Benzene 16 6173-H1 0.0005 5.00E-01 0.108% 0.038% 5 Benzene 2 6173-A2 0.0001 5.00E-01 0.021% YES 0.03% 5 Benzene 4 6173-B1 0.0001 5.00E-01 0.021% YES 0.03% 5 Benzene 8 6173-D1 0.0001 5.00E-01 0.021% YES 0.03% 5 Benzene 8 6173-D1 0.0001 5.00E-01 0.021% YES 0.03% 5 Benzene 10 6173-E1 0.0001 5.00E-01 0.022% 0.03% 0.03% 5 Benzene 12 6173-E1 0.0001 5.00E-01 0.022% 0.03% 0.03% 5 Benzene 14 6173-G1 0.0001 5.00E-01 0.022% 0.03% 5 Benzene 16 6173-H2 0.0001 5.00E-01 0.022% 0.03% 0.03% 5 Benzene 16 6173-H2 0.0001 5.00E-01 0.022% 0.03% 0.03% 5 Benzene 16 6173-H2 0.0001 5.00E-01 0.022% 0.03% 0	5	Benzene	16	6172-H2	0.0001	5.00E-01	0.030%		0.03%
Senzene		Benzene		6173-A1		5.00E-01			0.03%
Senzene		Benzene			0.0005	5.00E-01	0.108%		0.03%
Senzene		Benzene							0.03%
Senzene		Benzene							
Senzene									
Servane								YES	
5 Benzene	100								
5 Benzene									
6 Biphenyl 16 6172-H1 0.0002 2.00E-01 0.085% YES 0.29% Biphenyl 2 6172-B1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 4 6172-B1 0.0002 2.00E-01 0.080% YES 0.29% 6 Biphenyl 4 6172-B1 0.0002 2.00E-01 0.080% YES 0.29% 6 Biphenyl 6 6 6172-C1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 8 6172-C1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 10 6172-E1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 11 0 6172-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6172-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6172-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6172-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6172-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6172-B1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6173-B1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 11 0 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 2 6173-A1 0.0003 2.00E-01 0.083% YES 0.29% 6 Biphenyl 2 6173-A2 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 1 0 6173-E1 0.0002 2.00E-01 0.088% YES 0.09% YES 0.09% YES 0.09% YES 0.004% YES									
6 Biphenyl 16 6172-H1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 2 6172-B1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 4 6172-B1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 6 6172-C1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 10 6172-E1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 12 6172-E1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 16 6172-H2 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-H1 0.0003 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-H1 0.0002 2.00E-01 0.015% YES 0.29%	5	Benzene	16	6173-H2	0.0001	5.00E-01	0.020%	YES	0.03%
6 Biphenyl 16 6172-H1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 2 6172-B1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 4 6172-B1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 6 6172-C1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 10 6172-E1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 12 6172-E1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 16 6172-H2 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-H1 0.0003 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-H1 0.0002 2.00E-01 0.015% YES 0.29%	6	Biphenyl	2	6172-A1	0.0002	2.00E-01	0.087%	YES	0.29%
6 Biphenyl 4 6172-B1 0.0002 2.00E-01 0.080% YES 0.29% Biphenyl 4 6172-B1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 6 6172-C1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 8 6172-D1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 10 6172-E1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 11 6172-E1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 12 6172-F1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 14 6172-G1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 15 6172-B1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 16 6172-B1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 16 6173-B1 0.0002 2.00E-01 0.082% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.093% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.093% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.093% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 1 0.0002 2.00E-01 0.0002 YES 0.0004 YES 0.000									
6 Biphenyl 6 6172-B1 0.0002 2.00E-01 0.084% YES 0.29% Biphenyl 6 6172-C1 0.0002 2.00E-01 0.081% YES 0.29% Biphenyl 8 6172-D1 0.0002 2.00E-01 0.083% YES 0.29% Biphenyl 10 6172-B1 0.0002 2.00E-01 0.083% YES 0.29% Biphenyl 12 6172-B1 0.0002 2.00E-01 0.083% YES 0.29% Biphenyl 12 6172-B1 0.0002 2.00E-01 0.085% YES 0.29% Biphenyl 14 6172-G1 0.0002 2.00E-01 0.085% YES 0.29% Biphenyl 16 6172-B1 0.0002 2.00E-01 0.085% YES 0.29% Biphenyl 16 6173-B1 0.0002 2.00E-01 0.085% YES 0.29% Biphenyl 2 6173-A1 0.0003 2.00E-01 0.085% YES 0.29% Biphenyl 2 6173-A1 0.0003 2.00E-01 0.83% YES 0.29% Biphenyl 2 6173-B1 0.0003 2.00E-01 0.287% YES 0.29% Biphenyl 2 6173-B1 0.0002 2.00E-01 0.987% YES 0.29% Biphenyl 3 6 6173-B1 0.0002 2.00E-01 0.987% YES 0.29% Biphenyl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% Biphenyl 5 6 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% Biphenyl 6 6 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% Biphenyl 8 6173-D1 0.0002 2.00E-01 0.091% YES 0.29% Biphenyl 10 6173-E1 0.0002 2.00E-01 0.090% YES 0.29% Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% Biphenyl 11 6 6173-H2 0.0002 2.00E-01 0.086% YES 0.29% Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% Biphenyl 14 6173-G1 0.0002 2.00E-01 0.088% YES 0.29% Biphenyl 14 6173-G1 0.0002 2.00E-01 0.088% YES 0.29% Biphenyl 14 6173-E1 0.0002 2.00E-01 0.086% YES 0.29% Biphenyl 14 6173-E1 0.0002 2.00E-01 0.086% YES 0.29% Biphenyl 15 6172-E1 0.0004 2.00E-01 0.086% YES 0.29% Biphenyl 16 6173-H2 0.0004 2.00E-01 0.086% YES 0.09% YES 0.09% YES 0.09% YES 0.004% YES 0.00									
6 Biphenyl 6 6172-C1 0.0002 2.00E-01 0.081% YES 0.29% 6 Biphenyl 8 6172-D1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 12 6172-F1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 14 6172-G1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 16 6173-H1 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 2 6173-A1 0.0002 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-A2 0.0002 2.00E-01 0.92% YES 0.29% 6 Biphenyl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% <tr< td=""><td></td><td>and the second</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>		and the second							
6 Biphenyl 8 6172-D1 0.0002 2.00E-D1 0.083% YES 0.29% 6 Biphenyl 10 6172-E1 0.0002 2.00E-D1 0.086% YES 0.29% 6 Biphenyl 14 6172-F1 0.0002 2.00E-D1 0.085% YES 0.29% 6 Biphenyl 16 6172-H2 0.0002 2.00E-D1 0.083% YES 0.29% 6 Biphenyl 16 6173-H1 0.0002 2.00E-D1 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.0006 2.00E-D1 0.287% YES 0.29% 6 Biphenyl 2 6173-A2 0.0002 2.00E-D1 0.097% YES 0.29% 6 Biphenyl 4 6173-C1 0.0002 2.00E-D1 0.087% YES 0.29% 6 Biphenyl 10 6173-C1 0.0002 2.00E-D1 0.088% YES 0.29%	6	A B.	6						
6 Biphenyl 12 6172-F1 0.0002 2.00E-01 0.084% YES 0.29% 6 Biphenyl 14 6172-G1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 16 6172-H2 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 2 6173-A1 0.0003 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.0006 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.0006 2.00E-01 0.085% YES 0.29% 6 Biphenyl 2 6173-A1 0.0006 2.00E-01 0.085% YES 0.29% 6 Biphenyl 2 6173-A1 0.0006 2.00E-01 0.092% YES 0.29% 6 Biphenyl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 8 6173-C1 0.0002 2.00E-01 0.093% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.086% YES 0.29% 7 1-Butanol 2 6172-A1 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 4 6172-B1 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 4 6172-E1 0.0004 2.00E+01 0.003% YES 0.004% 7 1-Butanol 8 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 16 6173-H1 0.0008 2.00E+01 0.004% YES 0.0	6	A 10 A 10	8	6172-D1	0.0002	2.00E-01	0.083%	YES	0.29%
6 Biphenyl 14 6172-G1 0.0002 2.00E-01 0.085% YES 0.29% 6 Biphenyl 16 6172-H2 0.00002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 2 6173-A1 0.0003 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.0006 2.00E-01 0.092% YES 0.29% 6 Biphenyl 4 6173-B1 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.087% YES 0.29% 6 Biphenyl 8 6173-D1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 10 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-H1 0.0002 2.00E-01 0.086% YES 0.29%	6	Biphenyl	10	6172-E1	0.0002	2.00E-01	0.086%	YES	0.29%
6 Biphenyl 16 6172-H2 0.0002 2.00E-01 0.083% YES 0.29% 6 Biphenyl 2 6173-H1 0.0003 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.00002 2.00E-01 0.287% YES 0.29% 6 Biphenyl 2 6173-R2 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.090% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.086% YES 0.29%	6	Biphenyl	12	6172-F1	0.0002	2.00E-01	0.084%	YES	0.29%
6 Biphenyl 2 6173-A1 0.0003 2.00E-01 0.151% YES 0.29% 6 Biphenyl 16 6173-H1 0.0006 2.00E-01 0.287% YES 0.29% 6 Biphenyl 2 6173-A2 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 4 6173-C1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.090% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 14 6173-G1 0.0004 2.00E-01 0.086% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% <	6	Biphenyl	14	6172-G1	0.0002	2.00E-01	0.085%	YES	0.29%
6 Biphenyl 16 6173-H1 0.0006 2.00E-01 0.287% YES 0.29% 6 Biphenyl 2 6173-A2 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.087% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.086% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6172-A1 0.026 2.00E+01 0.129% 0.004 0.004 0.004 0.	6	Biphenyl	16	6172-H2	0.0002	2.00E-01	0.083%	YES	0.29%
6 Biphenyl 2 6173-A2 0.0002 2.00E-01 0.092% YES 0.29% 6 Biphenyl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% 6 Biphenyl 8 6173-D1 0.0002 2.00E-01 0.090% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.086% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 4<	6	Biphenyl	2	6173-A1	0.0003	2.00E-01	0.151%	YES	0.29%
6 Bipheryl 4 6173-B1 0.0002 2.00E-01 0.091% YES 0.29% 6 Bipheryl 6 6173-C1 0.0002 2.00E-01 0.087% YES 0.29% 6 Bipheryl 10 6173-E1 0.0002 2.00E-01 0.098% YES 0.29% 6 Bipheryl 12 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Bipheryl 14 6173-G1 2.00E-01 0.086% YES 0.29% 6 Bipheryl 14 6173-G1 2.00E-01 0.086% YES 0.29% 6 Bipheryl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 6 Bipheryl 16 6172-H1 0.026 2.00E+01 0.179% YES 0.29% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 <td>6</td> <td>Biphenyl</td> <td>16</td> <td>6173-H1</td> <td>0.0006</td> <td>2.00E-01</td> <td>0.287%</td> <td>YES</td> <td>0.29%</td>	6	Biphenyl	16	6173-H1	0.0006	2.00E-01	0.287%	YES	0.29%
6 Biphenyl 6 6173-C1 0.0002 2.00E-01 0.087% YES 0.29% 6 Biphenyl 8 6173-D1 0.0002 2.00E-01 0.099% YES 0.29% 6 Biphenyl 10 6173-F1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 14 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.086% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6172-A1 0.026 2.00E+01 0.179% YES 0.29% 6 Biphenyl 16 6172-A1 0.026 2.00E+01 0.123% 0.004% 7 1-Butanol 16 6172-A1 0.026 2.00E+01 0.023% 0.004% 7 1-Butanol 4<	6	Biphenyl	2	6173-A2	0.0002	2.00E-01	0.092%	YES	0.29%
6 Biphenyl 8 6173-D1 0.0002 2.00E-01 0.090% YES 0.29% 6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 14 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-H1 0.0004 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.023% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol	6	Biphenyl	4	6173-B1	0.0002	2.00E-01	0.091%	YES	0.29%
6 Biphenyl 10 6173-E1 0.0002 2.00E-01 0.088% YES 0.29% 6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.023% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 <	6	Biphenyl	6	6173-C1	0.0002	2.00E-01	0.087%	YES	0.29%
6 Biphenyl 12 6173-F1 0.0002 2.00E-01 0.086% YES 0.29% 6 Biphenyl 14 6173-G1 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.03% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.003% 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-H1	6	Biphenyl	8	6173-D1	0.0002	2.00E-01	0.090%	YES	0.29%
6 Biphenyl 14 6173-G1 2.00E-01 0.179% YES 0.29% 6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.03% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14	6	Biphenyl	10	6173-E1	0.0002	2.00E-01	0.088%	YES	0.29%
6 Biphenyl 16 6173-H2 0.0004 2.00E-01 0.179% YES 0.29% 7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.003% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol					0.0002		0.086%	YES	
7 1-Butanol 2 6172-A1 0.026 2.00E+01 0.129% 0.004% 7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.003% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.009% YES 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.098% 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004%		Biphenyl				2.00E-01			0.29%
7 1-Butanol 16 6172-H1 0.025 2.00E+01 0.123% 0.004% 7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.003% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.0004 2.00E+01 0.002% YES 0.004% 7	6	Biphenyl	16	6173-H2	0.0004	2.00E-01	0.179%	YES	0.29%
7 1-Butanol 2 6172-A2 0.0007 2.00E+01 0.003% 0.004% 7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 0.002 2.00E+01 0.098% 0.004% 7	7	1-Butanol	2	6172-A1	0.026	2.00E+01	0.129%		0.004%
7 1-Butanol 4 6172-B1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004%	7	1-Butanol	16	6172-H1	0.025	2.00E+01	0.123%		0.004%
7 1-Butanol 6 6172-C1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.004% YES 0.004% 7 1-Butanol	7	1-Butanol	2	6172-A2	0.0007	2.00E+01	0.003%		0.004%
7 1-Butanol 8 6172-D1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.098% 0.004% 7 1-Butanol 4 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8	7	1-Butanol	4	6172-B1	0.0004	2.00E+01	0.002%	YES	0.004%
7 1-Butanol 10 6172-E1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.098% 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.098% 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1	7	1-Butanol	6	6172-C1	0.0004	2.00E+01	0.002%	YES	0.004%
7 1-Butanol 12 6172-F1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.098% 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 4 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10	7	1-Butanol	8	6172-D1	0.0004	2.00E+01	0.002%	YES	0.004%
7 1-Butanol 14 6172-G1 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.098% 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.004% YES 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10	7	1-Butanol	10	6172-E1	0.0004	2.00E+01	0.002%	YES	0.004%
7 1-Butanol 16 6172-H2 0.0004 2.00E+01 0.002% YES 0.004% 7 1-Butanol 2 6173-A1 2.00E+01 0.098% 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.004% YES 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 9 1-Butanol 12	7	1-Butanol	12	6172-F1	0.0004	2.00E+01	0.002%	YES	0.004%
7 1-Butanol 2 6173-A1 2.00E+01 0.004% 7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.004% YES 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%									
7 1-Butanol 16 6173-H1 0.020 2.00E+01 0.098% 0.004% 7 1-Butanol 2 6173-A2 2.00E+01 0.004% YES 0.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%					0.0004		0.002%	YES	
7 1-Butanol 2 6173-A2 2.00E+01 0.004% 9.004% 7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% 9.004% 9.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% 9.004									
7 1-Butanol 4 6173-B1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%					0.020		0.098%		
7 1-Butanol 6 6173-C1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%									
7 1-Butanol 8 6173-D1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%									
7 1-Butanol 10 6173-E1 0.0008 2.00E+01 0.004% YES 0.004% 7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%									
7 1-Butanol 12 6173-F1 0.0008 2.00E+01 0.004% YES 0.004%									
7 1-Butanol 14 6173-G1 0.0008 2.00E+01 0.004% YES 0.004%									
	7	1-Butanol	14	6173-G1	0.0008	2.00E+01	0.004%	YES	0.004%

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement	Approx. DL
7	1-Butanol	16	6173-H2	0.0008	2.00E+01	0.004%	< DL? YES	(%OEL) 0.004%
,	1-Butanoi	16	61/3-HZ	0.0008	2.00E+01	0.004%	163	0.004%
9	2-Hexanone	2	6172-A1	0.0010	5.00E+00	0.020%		0.016%
9	2-Hexanone	16	6172-H1	0.0007	5.00E+00	0.015%	YES	0.016%
9	2-Hexanone	2	6172-A2	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	4	6172-B1	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	6	6172-C1	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	8	6172-D1	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	10	6172-E1	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	12	6172-F1	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	14	6172-G1	0.0002	5.00E+00	0.003%		0.016%
9	2-Hexanone	16	6172-H2	0.0002	5.00E+00	0.003%	YES	0.016%
9	2-Hexanone	2	6173-A1		5.00E+00			0.016%
9	2-Hexanone	16	6173-H1	0.0008	5.00E+00	0.016%	YES	0.016%
9	2-Hexanone	2	6173-A2		5.00E+00			0.016%
9	2-Hexanone	4	6173-B1	0.0001	5.00E+00	0.002%		0.016%
9	2-Hexanone	6	6173-C1	0.0001	5.00E+00	0.002%	YES	0.016%
9	2-Hexanone	8	6173-D1	0.0001	5.00E+00	0.002%	YES	0.016%
9	2-Hexanone	10	6173-E1	0.0001	5.00E+00	0.002%	YES	0.016%
9	2-Hexanone	12	6173-F1	0.0001	5.00E+00	0.002%	YES	0.016%
9	2-Hexanone	14	6173-G1	0.0001	5.00E+00	0.002%	1/50	0.016%
9	2-Hexanone	16	6173-H2	0.0001	5.00E+00	0.002%	YES	0.016%
11	4-Methyl-2-hexanone	2	6172-A1	0.0001	5.00E-01	0.028%	YES	0.033%
11	4-Methyl-2-hexanone	16	6172-H1	0.0002	5.00E-01	0.033%	YES	0.033%
11	4-Methyl-2-hexanone	2	6172-A2	0.0002	5.00E-01	0.031%	YES	0.033%
11	4-Methyl-2-hexanone	4	6172-B1	0.0002	5.00E-01	0.032%	YES	0.033%
11	4-Methyl-2-hexanone	6	6172-C1	0.0001	5.00E-01	0.029%	YES	0.033%
11	4-Methyl-2-hexanone	8	6172-D1	0.0002	5.00E-01	0.030%	YES	0.033%
11	4-Methyl-2-hexanone	10	6172-E1	0.0001	5.00E-01	0.030%	YES	0.033%
11	4-Methyl-2-hexanone	12	6172-F1	0.0001	5.00E-01	0.029%	YES	0.033%
11	4-Methyl-2-hexanone	14	6172-G1	0.0001	5.00E-01	0.029%	YES	0.033%
11	4-Methyl-2-hexanone	16	6172-H2	0.0001	5.00E-01	0.029%	YES	0.033%
11	4-Methyl-2-hexanone	2	6173-A1		5.00E-01			0.033%
11	4-Methyl-2-hexanone	16	6173-H1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	2	6173-A2		5.00E-01			0.033%
11	4-Methyl-2-hexanone	4	6173-B1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	6	6173-C1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	8	6173-D1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	10	6173-E1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	12	6173-F1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	14	6173-G1	0.0001	5.00E-01	0.015%	YES	0.033%
11	4-Methyl-2-hexanone	16	6173-H2	0.0001	5.00E-01	0.015%	YES	0.033%
13	3-Buten-2-one	2	6172-A1	0.0006	2.00E-01	0.291%		0.093%
13	3-Buten-2-one	16	6172-H1	0.0008	2.00E-01	0.380%		0.093%
13	3-Buten-2-one	2	6172-A2	0.0002	2.00E-01	0.093%	YES	0.093%
13	3-Buten-2-one	4	6172-B1	0.0002	2.00E-01	0.114%		0.093%
13	3-Buten-2-one	6	6172-C1	0.0002	2.00E-01	0.087%	YES	0.093%
13	3-Buten-2-one	8	6172-D1	0.0006	2.00E-01	0.285%		0.093%
13	3-Buten-2-one	10	6172-E1	0.0002	2.00E-01	0.088%	YES	0.093%
13	3-Buten-2-one	12	6172-F1	0.0012	2.00E-01	0.594%		0.093%
13	3-Buten-2-one	14	6172-G1	0.0002	2.00E-01	0.087%	YES	0.093%
13	3-Buten-2-one	16	6172-H2	0.0013	2.00E-01	0.644%		0.093%
13	3-Buten-2-one	2	6173-A1		2.00E-01			0.093%
13	3-Buten-2-one	16	6173-H1	0.0006	2.00E-01	0.311%		0.093%
13	3-Buten-2-one	2	6173-A2		2.00E-01			0.093%
13	3-Buten-2-one	4	6173-B1	0.0002	2.00E-01	0.082%	YES	0.093%
13	3-Buten-2-one	6	6173-C1	0.0002	2.00E-01	0.082%	YES	0.093%
13	3-Buten-2-one	8	6173-D1	0.0002	2.00E-01	0.082%	YES	0.093%
13 13	3-Buten-2-one 3-Buten-2-one	10 12	6173-E1 6173-F1	0.0002	2.00E-01 2.00E-01	0.081% 0.080%	YES YES	0.093% 0.093%

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement	Approx. DL
13	3-Buten-2-one	14	6173-G1	0.0002	2.00E-01	0.079%	< DL? YES	(%OEL) 0.093%
13	3-Buten-2-one	16	6173-G1 6173-H2	0.0002	2.00E-01	0.079%	YES	0.093%
	Campaldahu J-	2	6172.44	0.014	2.005.04	4.000/		0.6674
14	Formaldehyde	2 16	6172-A1	0.014	3.00E-01	4.60%		0.607%
14 14	Formaldehyde	2	6172-H1 6172-A2	0.005 0.004	3.00E-01 3.00E-01	1.67% 1.22%		0.607% 0.607%
14	Formaldehyde Formaldehyde	4	6172-A2	0.004	3.00E-01	0.983%		0.607%
14	Formaldehyde	6	6172-C1	0.002	3.00E-01	0.567%	YES	0.607%
14	Formaldehyde	8	6172-D1	0.002	3.00E-01	0.623%	ILD	0.607%
14	Formaldehyde	10	6172-E1	0.002	3.00E-01	0.597%	YES	0.607%
14	Formaldehyde	12	6172-F1	0.002	3.00E-01	0.600%	YES	0.607%
14	Formaldehyde	14	6172-G1	0.002	3.00E-01	0.597%	YES	0.607%
14	Formaldehyde	16	6172-H2	0.002	3.00E-01	0.587%	YES	0.607%
14	Formaldehyde	2	6173-A1	0.016	3.00E-01	5.22%		0.607%
14	Formaldehyde	16	6173-H1	0.008	3.00E-01	2.51%		0.607%
14	Formaldehyde	2	6173-A2	0.006	3.00E-01	2.08%		0.607%
14	Formaldehyde	4	6173-B1	0.003	3.00E-01	1.08%		0.607%
14	Formaldehyde	6	6173-C1	0.002	3.00E-01	0.607%	YES	0.607%
14	Formaldehyde	8	6173-D1	0.002	3.00E-01	0.603%	YES	0.607%
14	Formaldehyde	10	6173-E1	0.002	3.00E-01	0.507%	YES	0.607%
14	Formaldehyde	12	6173-F1	0.002	3.00E-01	0.603%	YES	0.607%
14	Formaldehyde	14	6173-G1	0.002	3.00E-01	0.607%	YES	0.607%
14	Formaldehyde	16	6173-H2	0.002	3.00E-01	0.593%	YES	0.607%
15	Acetaldehyde	2	6172-A1	0.056	2.50E+01	0.222%		0.005%
15	Acetaldehyde	16	6172-H1	0.051	2.50E+01	0.205%		0.005%
15	Acetaldehyde	2	6172-A2	0.027	2.50E+01	0.109%		0.005%
15	Acetaldehyde	4	6172-B1	0.032	2.50E+01	0.128%		0.005%
15	Acetaldehyde	6	6172-C1	0.028	2.50E+01	0.112%		0.005%
15	Acetaldehyde	8	6172-D1	0.031	2.50E+01	0.125%		0.005%
15	Acetaldehyde	10	6172-E1	0.027	2.50E+01	0.107%		0.005%
15	Acetaldehyde	12	6172-F1	0.024	2.50E+01	0.096%		0.005%
15	Acetaldehyde	14	6172-G1	0.029	2.50E+01	0.117%		0.005%
15	Acetaldehyde	16	6172-H2	0.029	2.50E+01	0.115%		0.005%
15	Acetaldehyde	2	6173-A1	0.046	2.50E+01	0.185%		0.005%
15	Acetaldehyde	16 2	6173-H1 6173-A2	0.049	2.50E+01	0.195% 0.110%		0.005%
15 15	Acetaldehyde Acetaldehyde	4	6173-A2 6173-B1	0.027 0.027	2.50E+01 2.50E+01	0.110%		0.005%
15	Acetaldehyde	6	6173-61	0.024	2.50E+01	0.095%		0.005%
15	Acetaldehyde	8	6173-D1	0.025	2.50E+01	0.099%		0.005%
15	Acetaldehyde	10	6173-E1	0.025	2.50E+01	0.099%		0.005%
15	Acetaldehyde	12	6173-F1	0.027	2.50E+01	0.109%		0.005%
15	Acetaldehyde	14	6173-G1	0.027	2.50E+01	0.109%		0.005%
15	Acetaldehyde	16	6173-H2	0.029	2.50E+01	0.117%		0.005%
16	Butanal	2	6172-A1	0.0019	2.50E+01	0.008%		0.001%
16	Butanal	16	6172-H1	0.0019	2.50E+01	0.008%		0.001%
16	Butanal	2	6172-A1	0.0003	2.50E+01	0.001%	YES	0.001%
16	Butanal	4	6172-B1	0.0003	2.50E+01	0.001%	123	0.001%
16	Butanal	6	6172-C1	0.0003	2.50E+01	0.001%	YES	0.001%
16	Butanal	8	6172-D1	0.0003	2.50E+01	0.001%	YES	0.001%
16	Butanal	10	6172-E1	0.0005	2.50E+01	0.002%		0.001%
16	Butanal	12	6172-F1	0.0003	2.50E+01	0.001%	YES	0.001%
16	Butanal	14	6172-G1	0.0004	2.50E+01	0.002%		0.001%
16	Butanal	16	6172-H2	0.0003	2.50E+01	0.001%	YES	0.001%
16	Butanal	2	6173-A1		2.50E+01			0.001%
16	Butanal	16	6173-H1	0.0012	2.50E+01	0.005%		0.001%
16	Butanal	2	6173-A2		2.50E+01			0.001%
16	Butanal	4	6173-B1	0.0003	2.50E+01	0.001%		0.001%
10			6172 61	0.0003	2 505+01	0.0019/	VEC	0.0019/
16	Butanal	6	6173-C1	0.0002	2.50E+01	0.001%	YES	0.001%
	Butanal Butanal Butanal	6 8 10	6173-D1 6173-E1	0.0002 0.0002 0.0002	2.50E+01 2.50E+01	0.001% 0.001% 0.001%	YES YES	0.001% 0.001% 0.001%

16 Butanal 12 6173-F1 0.0002 2.50E+01 0.001% 16 Butanal 14 6173-G1 0.0002 2.50E+01 0.001% 16 Butanal 16 6173-H2 0.0002 2.50E+01 0.001% 19 Furan 2 6172-H1 0.000027 1.00E-03 2.772% 19 Furan 16 6172-H1 0.00003 1.00E-03 3.589% 19 Furan 16 6172-H1 0.000009 1.00E-03 0.868% 19 Furan 4 6172-E1 0.000009 1.00E-03 0.858% 19 Furan 6 6172-C1 0.000008 1.00E-03 0.851% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.851% 19 Furan 10 6172-H1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-H1 0.000009 1.00E-03 0.855% 19	< DL?	Approx. DL (%OEL)
16 Butanal 14 6173-G1 0.0002 2.50E+01 0.001% 16 Butanal 16 6173-H2 0.0002 2.50E+01 0.001% 19 Furan 2 6172-A1 0.000027 1.00E-03 2.72% 19 Furan 16 6172-H1 0.000036 1.00E-03 3.58% 19 Furan 2 6172-A2 0.000009 1.00E-03 0.868% 19 Furan 4 6172-B1 0.000008 1.00E-03 0.812% 19 Furan 6 6172-C1 0.000008 1.00E-03 0.812% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.855% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-G1 0.00009 1.00E-03 0.855% 19 Furan 16 6172-H2 0.00009 1.00E-03 0.855% 19 <t< td=""><td>YES</td><td>0.001%</td></t<>	YES	0.001%
16 Butanal 16 6173-H2 0.0002 2.50E+01 0.001% 19 Furan 2 6172-H1 0.000027 1.00E-03 2.72% 19 Furan 16 6172-H1 0.000036 1.00E-03 0.868% 19 Furan 4 6172-B1 0.000008 1.00E-03 0.868% 19 Furan 4 6172-B1 0.000008 1.00E-03 0.812% 19 Furan 6 6172-C1 0.000008 1.00E-03 0.853% 19 Furan 10 6172-E1 0.00009 1.00E-03 0.853% 19 Furan 12 6172-E1 0.00009 1.00E-03 0.855% 19 Furan 14 6172-E1 0.00009 1.00E-03 0.856% 19 Furan 16 6172-H2 0.00009 1.00E-03 0.856% 19 Furan 16 6172-H2 0.00008 1.00E-03 0.847% 19	YES	0.001%
Furan 16 6172-H1 0.000036 1.00E-03 0.868% Furan 2 6172-A2 0.000009 1.00E-03 0.868% Furan 4 6172-B1 0.000008 1.00E-03 0.779% Furan 6 6172-C1 0.000008 1.00E-03 0.812% Furan 8 6172-C1 0.000009 1.00E-03 0.853% Furan 10 6172-E1 0.000009 1.00E-03 0.853% Furan 12 6172-F1 0.000009 1.00E-03 0.855% Furan 14 6172-G1 0.000009 1.00E-03 0.855% Furan 14 6172-G1 0.000009 1.00E-03 0.855% Furan 16 6172-H2 0.000009 1.00E-03 0.856% Furan 16 6172-H2 0.000009 1.00E-03 0.847% Furan 2 6173-A1 0.000035 1.00E-03 0.847% Furan 16 6173-H1 0.000048 1.00E-03 3.46% Furan 2 6173-A2 0.000010 1.00E-03 0.861% Furan 4 6173-B1 0.000009 1.00E-03 0.861% Furan 6 6173-C1 0.000008 1.00E-03 0.861% Furan 8 6173-D1 0.000010 1.00E-03 0.861% Furan 10 6173-E1 0.000011 1.00E-03 0.861% Furan 10 6173-E1 0.000011 1.00E-03 0.861% Furan 12 6173-F1 0.000011 1.00E-03 0.861% Furan 14 6173-G1 0.000008 1.00E-03 0.861% Furan 16 6172-H1 0.000012 1.00E-03 0.861% Furan 16 6172-H1 0.000015 1.00E-03 0.855% Furan 16 6172-H1 0.000015 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 3 6172-P1 0.000015 1.00E-03 1.65% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20	YES	0.001%
19 Furan 2 6172-A2 0.000009 1.00E-03 0.868% 19 Furan 4 6172-B1 0.000008 1.00E-03 0.779% 19 Furan 6 6172-C1 0.000009 1.00E-03 0.853% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.853% 19 Furan 12 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 16 6172-H2 0.000009 1.00E-03 0.855% 19 Furan 16 6172-H2 0.000009 1.00E-03 0.847% 19 Furan 16 6173-H1 0.000035 1.00E-03 0.847% 19 Furan 16 6173-H1 0.000048 1.00E-03 0.846% 19		0.87%
19 Furan 4 6172-B1 0.000008 1.00E-03 0.779% 19 Furan 6 6172-C1 0.000008 1.00E-03 0.812% 19 Furan 8 6172-D1 0.000009 1.00E-03 0.853% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.855% 19 Furan 12 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-G1 0.000009 1.00E-03 0.856% 19 Furan 16 6172-H2 0.000008 1.00E-03 0.856% 19 Furan 2 6173-A1 0.000008 1.00E-03 0.847% 19 Furan 16 6173-H1 0.000008 1.00E-03 0.846% 19 Furan 2 6173-A2 0.000010 1.00E-03 0.861% 19 Furan 4 6173-B1 0.000008 1.00E-03 0.846% 19		0.87%
19 Furan 6 6172-C1 0.000008 1.00E-03 0.812% 19 Furan 8 6172-D1 0.000009 1.00E-03 0.853% 19 Furan 10 6172-E1 0.000009 1.00E-03 0.851% 19 Furan 12 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-H2 0.000008 1.00E-03 0.856% 19 Furan 16 6172-H2 0.000035 1.00E-03 0.847% 19 Furan 16 6173-H1 0.000035 1.00E-03 0.847% 19 Furan 16 6173-H1 0.000035 1.00E-03 0.846% 19 Furan 16 6173-H2 0.000010 1.00E-03 0.861% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 8 6173-D1 0.000010 1.00E-03 0.846% 19	YES	0.87%
Furan 8 6172-D1 0.000009 1.00E-03 0.853% Furan 10 6172-E1 0.000009 1.00E-03 0.851% Furan 12 6172-F1 0.000009 1.00E-03 0.851% Furan 14 6172-G1 0.000009 1.00E-03 0.855% Furan 14 6172-G1 0.000009 1.00E-03 0.856% Furan 16 6172-H2 0.000008 1.00E-03 0.847% Furan 2 6173-A1 0.000035 1.00E-03 0.847% Furan 16 6173-H1 0.000048 1.00E-03 0.847% Furan 2 6173-A2 0.000010 1.00E-03 0.973% Furan 4 6173-B1 0.000009 1.00E-03 0.861% Furan 6 6173-C1 0.000008 1.00E-03 0.846% Furan 8 6173-D1 0.000010 1.00E-03 0.846% Furan 10 6173-E1 0.000011 1.00E-03 1.01% Furan 12 6173-F1 0.000011 1.00E-03 0.861% Furan 14 6173-G1 0.000009 1.00E-03 0.861% Furan 14 6173-G1 0.000008 1.00E-03 0.835% Furan 16 6172-H1 0.000016 1.00E-03 1.65% O 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.65% O 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% O 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.55% O 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.66% O 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% O 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.65% O 2,3-Dihydrofuran 14 6172-E1 0.000016 1.00E-03 1.65% O 2,3-Dihydrofuran 14 6172-E1 0.000016 1.00E-03 1.65% O 2,3-Dihydrofu	YES	0.87%
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19 Furan 12 6172-F1 0.000009 1.00E-03 0.855% 19 Furan 14 6172-G1 0.000009 1.00E-03 0.856% 19 Furan 16 6172-H2 0.000008 1.00E-03 0.847% 19 Furan 2 6173-A1 0.000035 1.00E-03 3.46% 19 Furan 16 6173-H1 0.000048 1.00E-03 3.46% 19 Furan 2 6173-A2 0.000010 1.00E-03 0.973% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 8 6173-D1 0.000010 1.00E-03 0.846% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.01% 19 Furan 12 6173-E1 0.000011 1.00E-03 0.861% 19 <t< td=""><td>YES</td><td>0.87%</td></t<>	YES	0.87%
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19 Furan 16 6172-H2 0.000008 1.00E-03 0.847% 19 Furan 2 6173-A1 0.000035 1.00E-03 3.46% 19 Furan 16 6173-H1 0.000048 1.00E-03 4.84% 19 Furan 2 6173-A2 0.000010 1.00E-03 0.973% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.846% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 10 6173-E1 0.000010 1.00E-03 1.01% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6172-H1 0.000013 1.00E-03 1.65% 20 <td< td=""><td>YES</td><td>0.87%</td></td<>	YES	0.87%
19 Furan 2 6173-A1 0.000035 1.00E-03 3.46% 19 Furan 16 6173-H1 0.000048 1.00E-03 4.84% 19 Furan 2 6173-A2 0.000010 1.00E-03 0.973% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.01% 19 Furan 12 6173-F1 0.000011 1.00E-03 1.07% 19 Furan 14 6173-F1 0.000009 1.00E-03 0.835% 19 Furan 14 6173-H2 0.000013 1.00E-03 0.835% 19 Furan 16 6172-H1 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000012 1.00E-03 1.65% 20	YES	0.87%
19 Furan 16 6173-H1 0.000048 1.00E-03 4.84% 19 Furan 2 6173-A2 0.000010 1.00E-03 0.973% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.01% 19 Furan 12 6173-F1 0.000011 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 0.835% 19 Furan 16 6172-H1 0.000008 1.00E-03 0.835% 19 Furan 16 6172-H1 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000014 1.00E-03 1.65% 20	YES	0.87%
19 Furan 2 6173-A2 0.000010 1.00E-03 0.973% 19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 8 6173-D1 0.000010 1.00E-03 1.01% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.00009 1.00E-03 0.835% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 0.835% 19 Furan 16 6172-A1 0.000013 1.00E-03 0.835% 19 Furan 2 6172-A1 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000014 1.00E-03 1.65% 20		0.87%
19 Furan 4 6173-B1 0.000009 1.00E-03 0.861% 19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 8 6173-D1 0.000010 1.00E-03 1.01% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 0.835% 19 Furan 16 6172-A1 0.000013 1.00E-03 1.85% 20 2,3-Dihydrofuran 2 6172-A1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.58%		0.87%
19 Furan 6 6173-C1 0.000008 1.00E-03 0.846% 19 Furan 8 6173-D1 0.000010 1.00E-03 1.01% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 1.65% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.59% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.58% 20 2,3-Dihydrofuran 8 6172-D1 0.000016 1.00E-03 1.66%		0.87%
19 Furan 8 6173-D1 0.000010 1.00E-03 1.01% 19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 1.65% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000015 1.00E-03 1.58% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03	YES	0.87%
19 Furan 10 6173-E1 0.000011 1.00E-03 1.07% 19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 1.65% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 8 6172-C1 0.000016 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03		0.87%
19 Furan 12 6173-F1 0.000009 1.00E-03 0.861% 19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 4.23% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-F1 0.000017 1.0		0.87%
19 Furan 14 6173-G1 0.000008 1.00E-03 0.835% 19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000012 1.00E-03 4.23% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.51% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000017 1.00E-03 1.58% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017		0.87%
19 Furan 16 6173-H2 0.000013 1.00E-03 1.29% 20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 4.23% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-E1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016<	YES	0.87%
20 2,3-Dihydrofuran 2 6172-A1 0.000042 1.00E-03 4.23% 20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.65%	YES	0.87%
20 2,3-Dihydrofuran 16 6172-H1 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.65%		0.87%
20 2,3-Dihydrofuran 2 6172-A2 0.000017 1.00E-03 1.69% 20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.65%		1.77%
20 2,3-Dihydrofuran 4 6172-B1 0.000015 1.00E-03 1.51% 20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 6 6172-C1 0.000016 1.00E-03 1.58% 20 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 8 6172-D1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 10 6172-E1 0.000017 1.00E-03 1.65% 20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 12 6172-F1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 14 6172-G1 0.000017 1.00E-03 1.66% 20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 16 6172-H2 0.000016 1.00E-03 1.65% 20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
20 2,3-Dihydrofuran 2 6173-A1 0.000016 1.00E-03 1.63%	YES	1.77%
The second of th	YES	1.77%
20 2,5-Dillydrordiali 16 61/5-H1 0.000020 1.00E-05 2.05%	153	1.77% 1.77%
20 2,3-Dihydrofuran 2 6173-A2 0.000017 1.00E-03 1.70%	YES	1.77%
20 2,3-Dihydrofuran 4 6173-B1 0.000017 1.00E-03 1.67%	YES	1.77%
20 2,3-Dihydrofuran 6 6173-C1 0.000016 1.00E-03 1.64%	YES	1.77%
20 2,3-Dihydrofuran 8 6173-D1 0.000018 1.00E-03 1.77%	YES	1.77%
20 2,3-Dihydrofuran 10 6173-E1 0.000025 1.00E-03 2.55%		1.77%
20 2,3-Dihydrofuran 12 6173-F1 0.000017 1.00E-03 1.67%	YES	1.77%
20 2,3-Dihydrofuran 14 6173-G1 0.000016 1.00E-03 1.62%	YES	1.77%
20 2,3-Dihydrofuran 16 6173-H2 0.000016 1.00E-03 1.62%	YES	1.77%
21 2,5-Dihydrofuran 2 6172-A1 0.000020 1.00E-03 2.03%	YES	2.17%
21 2,5-Dihydrofuran 16 6172-H1 0.000021 1.00E-03 2.10%	YES	2.17%
21 2,5-Dihydrofuran 2 6172-A2 0.000022 1.00E-03 2.15%	YES	2.17%
21 2,5-Dihydrofuran 4 6172-B1 0.000019 1.00E-03 1.93%	YES	2.17%
21 2,5-Dihydrofuran 6 6172-C1 0.000020 1.00E-03 2.02%	YES	2.17%
21 2,5-Dihydrofuran 8 6172-D1 0.000021 1.00E-03 2.12%	YES	2.17%
21 2,5-Dihydrofuran 10 6172-E1 0.000024 1.00E-03 2.39%		2.17%
21 2,5-Dihydrofuran 12 6172-F1 0.000021 1.00E-03 2.12%	YES	2.17%
21 2,5-Dihydrofuran 14 6172-G1 0.000021 1.00E-03 2.13%	YES	2.17%
21 2,5-Dihydrofuran 16 6172-H2 0.000021 1.00E-03 2.10%	YES	2.17%
21 2,5-Dihydrofuran 2 6173-A1 0.000021 1.00E-03 2.09%	YES	2.17%
21 2,5-Dihydrofuran 16 6173-H1 0.000021 1.00E-03 2.12%	YES	2.17%
21 2,5-Dihydrofuran 2 6173-A2 0.000022 1.00E-03 2.17%	YES	2.17%
21 2,5-Dihydrofuran 4 6173-B1 0.000021 1.00E-03 2.14%	YES	2.17%
21 2,5-Dihydrofuran 6 6173-C1 0.000021 1.00E-03 2.10%	YES	2.17%
21 2,5-Dihydrofuran 8 6173-D1 0.000038 1.00E-03 3.84%		2.17%

2 2.5-Dihydrofuran 10 6173-E1 0.000022 1.00E-03 2.17% YES 2.17% 12 2.5-Dihydrofuran 12 6173-E1 0.000021 1.00E-03 2.14% YES 2.17% 12 2.5-Dihydrofuran 14 6173-E1 0.000021 1.00E-03 2.07% YES 2.17% 12 2.5-Dihydrofuran 16 6173-E1 0.000021 1.00E-03 2.07% YES 2.17% 12 2.5-Dihydrofuran 16 6173-E1 0.000021 1.00E-03 2.07% YES 2.17% 12 2.5-Dihydrofuran 16 6173-E1 0.000021 1.00E-03 2.07% YES 2.17% YES 2.17% 12 2.5-Dihydrofuran 2 6 6173-E1 0.000017 1.00E-03 1.00E-03 1.59% YES 1.93% 12 2.5-Dihydrofuran 2 6 6172-E1 0.000018 1.00E-03 1.59% YES 1.93% 12 2.5-Dihydrofuran 4 6 6172-E1 0.000018 1.00E-03 1.59% YES 1.93% 12 2.5-Dihydrofuran 8 6 6172-C1 0.000018 1.00E-03 1.59% YES 1.93% 12 2.5-Dihydrofuran 8 6 6172-C1 0.000018 1.00E-03 1.59% YES 1.93% 12 2.5-Dihydrofuran 10 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 12 6172-E1 0.000018 1.00E-03 1.81% YES 1.93% 12 2.5-Dihydrofuran 16 6173-H1 0.000018 1.00E-03 1.80% YES 1.93% 12 2.5-Dihydrofuran 16 6173-H1 0.000018 1.00E-03 1.80% YES 1.93% 12 2.5-Dihydrofuran 16 6173-H1 0.000018 1.00E-03 1.80% YES 1.93% 12 2.5-Dihydrofuran 18 6173-E1 0.000018 1.00E-03 1.80% YES 1.93% 12 2.5-Dihydrofuran 12 6173-E1 0.000018 1.00E-03 1.80% YES 1.93% 12 2.5-Dihydrofuran 12 6173-E1 0.000018 1.00E-03 1.80% YES 1.93% YES 1.93% 12 2.5-Dihydrofuran 12 6173-E1 0.000018 1.00E-03 1.80% YES 1.93% YES 1.93% 12 2.5-Dihydrofuran 12 6173-E1 0.000018 1.00E-03 1.80% YES 1.93% YES 1.93	COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement	Approx. DL
21 2.5 Dilyytrofuran		•						< DL?	(%OEL)
22 2.5 Dihydrofuran		A CONTRACTOR OF THE CONTRACTOR							
22 2,-Methylfuran 2 6 6173-41 0,00001 1,006-03 1,73% YES 2,77% 1,22 2,-Methylfuran 16 6 6172-41 0,000018 1,006-03 1,73% YES 1,93% 1,22 2,-Methylfuran 2 6 6172-61 0,000018 1,006-03 1,73% YES 1,93% 1,22 2,-Methylfuran 4 6 6172-61 0,000018 1,006-03 1,14% YES 1,93% 1,22 2,-Methylfuran 6 6 6172-61 0,000017 1,006-03 1,14% YES 1,93% 1,22 2,-Methylfuran 10 6,6172-61 0,000018 1,006-03 1,12% YES 1,93% 1,22 2,-Methylfuran 10 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 10 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 11 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 12 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 12 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 12 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 12 6,6172-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 2 6,6173-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 2 6,6173-61 0,000018 1,006-03 1,13% YES 1,93% 1,22 2,-Methylfuran 2 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 2 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 2 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 16 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 16 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 16 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 10 6,6173-61 0,000018 1,006-03 1,16% YES 1,93% 1,22 2,-Methylfuran 10 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,22 2,-Methylfuran 10 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,22 2,-Methylfuran 10 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,25 Dimethylfuran 10 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,25 Dimethylfuran 10 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,25 Dimethylfuran 16 6,6173-61 0,000018 1,006-03 1,25% YES 1,93% 1,25 Dimethylfuran 16 6,6173-61 0,000018 1,006-03 1,25% YES 3,00% 1,25 Dimethylfuran 16 6,6172-61 0,000018 1,006-03 1,25% YES 3,00% 1,25 Dimethylfuran 10 6,6172-61 0,000018 1,006-03 1,2									
2 2-Methyffuran 16 6177-A1 0.000018 1.006-03 1.79% YES 1.99% YES 1									
22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.79% YES 1.93% 22 2 - AMETHYTURAN 2 6 6172-41 0.000017 1.00-603 1.69% YES 1.93% 22 2 - AMETHYTURAN 3 6 6172-61 0.000017 1.00-603 1.69% YES 1.93% 22 2 - AMETHYTURAN 3 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 3 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 10 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 11 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 12 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 13 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 14 6 6172-61 0.000018 1.00-603 1.81% YES 1.93% 22 2 - AMETHYTURAN 15 6 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 16 6172-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 18 6173-01 0.000019 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 18 6173-01 0.000019 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 18 6173-01 0.000019 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 18 6173-01 0.000019 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 19 6173-41 0.000018 1.00-603 1.75% YES 1.93% 22 2 - AMETHYTURAN 19 6173-41 0.000018 1.00-603 1.75% YES 1.93% 22 2 - AMETHYTURAN 19 6173-41 0.000018 1.00-603 1.75% YES 1.93% 22 2 - AMETHYTURAN 19 6173-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 19 6173-41 0.000018 1.00-603 1.80% YES 1.93% 22 2 - AMETHYTURAN 23 2 3 - DIBETHYTURAN 24 6173-41 0.000019 1.00-603 1.80% YES 1.93% 25 2 - DIBETHYTURAN 25 1.93% YES 1.93% 26 1.93% YES 1.93% 27 2 3 - DIBETHYTURAN 26 6172-41 0.000019 1.00-603 1.80% YES 1.93% 28 2 3 - DIBETHYTURAN 27 2 - DIBETHYTURAN 28 6172-41 0.000019 1.00-603 1.80% YES 1.93% 28 2 3 - DIBETHYTURAN 29 6172-41 0.000019 1.00-603 1.80% YES 1.93% 29 2 3 2 - DIBETHYTURAN 20 6172-41 0.0000019 1.00-603 1.80% YES 1.9		2,0 0, 4		02.0	0.000	2.002.00	2.00	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2,2770
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22 2 - AMethyffuran		DE STOCK CONTRACTOR OF THE PROPERTY OF							
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22 2-Methylfuran	22	The state of the s							
22 2-Methylfuran 10 6173-E1 0.000019 1.00E-03 1.83% YES 1.93% 12 2-Methylfuran 12 6173-E1 0.000018 1.00E-03 1.85% YES 1.93% 12 2-Methylfuran 14 6173-E1 0.000018 1.00E-03 1.82% YES 1.93% 12 2-Methylfuran 14 6173-E1 0.000018 1.00E-03 1.77% YES 1.93% 12 2-Methylfuran 16 6173-E1 0.000018 1.00E-03 1.77% YES 1.93% 12 2-Methylfuran 16 6173-E1 0.000018 1.00E-03 1.77% YES 1.93% 12 2-Methylfuran 16 6173-E1 0.000018 1.00E-03 1.77% YES 1.93% 12 2-Methylfuran 16 6172-E1 0.000018 1.00E-03 2.67% YES 1.93% 12 2-Methylfuran 16 6172-E1 0.000029 1.00E-03 2.67% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.67% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000020 1.00E-03 2.64% YES 3.08% 12 2.5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 11 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 14 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.89% YES 3.08% 12 2.5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.88% YES 3.08% 12 2.5-Dimethylfuran 16 6173-E1 0.00	22	TO BUTTER TO STATE OF THE PROPERTY OF THE PARTY OF THE PA		6173-B1	0.000018	1.00E-03	1.82%	YES	1.93%
22 2-Methylfuran 10 6173-E1 0.000019 1.00E-03 1.85% YES 1.93% 22 2-Methylfuran 12 6173-G1 0.000018 1.00E-03 1.82% YES 1.93% 22 2-Methylfuran 14 6173-G1 0.000018 1.00E-03 1.77% YES 1.93% 22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.76% YES 1.93% 22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.76% YES 1.93% 22 2-Methylfuran 2 6172-A1 0.000028 1.00E-03 2.76% YES 3.08% 23 2,5-Dimethylfuran 2 6172-A2 0.000029 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000029 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000029 1.00E-03 2.64% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-F1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-F1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 6 6173-H1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 6 6173-H2 0.000030 1.00E-03 2.99% YES 3.08% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000030 1.00E-03 2.99% YES 3.08% YES 3.0	22	2-Methylfuran	6	6173-C1	0.000018	1.00E-03	1.79%	YES	1.93%
22 2-Methylfuran 12 6173-F1 0.000018 1.00E-03 1.82% YES 1.93% 22 2-Methylfuran 14 6173-F1 0.000018 1.00E-03 1.77% YES 1.93% 22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.77% YES 1.93% 22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.77% YES 1.93% 22 2-Methylfuran 2 6172-A1 0.000028 1.00E-03 2.76% YES 3.08% 23 2,5-Dimethylfuran 2 6172-A2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000029 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 6 6 6172-C1 0.000027 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 12 6172-F1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000010 1.00E-03 2.99% YES 3.08% YES 3.0	22	2-Methylfuran	8	6173-D1	0.000019	1.00E-03	1.93%	YES	1.93%
22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.77% YES 1.93% 22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.76% YES 1.93% 23 2,5-Dimethylfuran 16 6172-H1 0.000028 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6172-H2 0.000029 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 4 6172-H3 0.000026 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.95% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 11 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H3 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-E1 0.000020 0.00100 1.58% YES 3.08% 23 2,5-Dimethylfuran 4 6172-E1 0.000016 0.00100 1.58% YES 3.08% 23 2,5-Dimethylfuran 4 6172-E1 0.000016 0.00100 1.58% YES 3.08% 24 2-Pentylfuran 5 6172-H1 0.000016 0.00100 1.59% YES 1.70% 25 2-Pentylfuran 16 6172-H1 0.00001	22	2-Methylfuran	10	6173-E1	0.000019	1.00E-03	1.85%	YES	1.93%
22 2-Methylfuran 16 6173-H2 0.000018 1.00E-03 1.76% YES 1.93% 23 2,5-Dimethylfuran 16 6172-H1 0.000029 1.00E-03 2.76% YES 3.08% 23 2,5-Dimethylfuran 2 6172-A2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000029 1.00E-03 2.64% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.64% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000027 1.00E-03 2.59% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.59% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000028 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000028 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 6 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6173-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 16 6173-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 16 6172-E1 0.000016 0.00100 1.58% YES 3.08% 24 2,5-Dimethylfuran 16 6173-E1 0.000016 0.00100 1.58% YES 3.08% 25 2,5-Dimethylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 3.08% 26 2,5-Dimethylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 3.08% 27 2-Pentylfuran 16 6172-E1 0.000016 0.00100 1.58% YES 3.08% 28 2,5-Dimethylfuran 16 6172-E1 0.000016 0.00100 1.58% YES 1.70% 27 2-Pentylfuran 16 6172-E1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 16 6172-E1 0.	22	2-Methylfuran	12	6173-F1	0.000018	1.00E-03	1.82%		1.93%
23 2,5-Dimethylfuran 2 6172-A1 0.000028 1.00E-03 2.67% YES 3.08% 23 2,5-Dimethylfuran 2 6172-A2 0.000029 1.00E-03 2.67% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000026 1.00E-03 2.64% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.59% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.59% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 112 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 112 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 114 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-A1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-E1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6173-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6173-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6173-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6173-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-B1 0.000010 1.00E-03 2.89% YES 3.08% 23 2,5		THE COURSE WAS PROPERTY.							
23 2,5-Dimethylfuran 2 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000026 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 11 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000028 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 11 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 11 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethy	22	2-Methylfuran	16	6173-H2	0.000018	1.00E-03	1.76%	YES	1.93%
23 2,5-Dimethylfuran 2 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000026 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 11 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000028 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 11 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethylfuran 11 6173-E1 0.000016 0.00100 1.59% YES 3.08% 23 2,5-Dimethy	23	2.5-Dimethylfuran	2	6172-A1	0.000028	1.00E-03	2.76%	YES	3.08%
23 2,5-Dimethylfuran 2 6172-A2 0.000029 1.00E-03 2.94% YES 3.08% 23 2,5-Dimethylfuran 4 6172-B1 0.000026 1.00E-03 2.5-Dimethylfuran 6 6172-C1 0.000027 1.00E-03 2.5-Dimethylfuran 8 6172-C1 0.000027 1.00E-03 2.5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-F1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000028 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000030 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000016 0.00100 1.58% YES 1.70% 2 -Pentylfuran 16 6172-H1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 16 6172-H1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 16 6172-H1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 12 6173-E1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES 1.70% 2 -Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES		N 100							
23 2,5-Dimethylfuran 8 6172-C1 0.000027 1.00E-03 2.75% YES 3.08% 23 2,5-Dimethylfuran 8 6172-D1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 12 6172-F1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.85% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000031 1.00E-03 2.95% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000031 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000032 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 12 6173-F1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 12 6173-F1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.83% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.83% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.83% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000010 1.58% YES 1.70% 2-Pentylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 1.70% 2-Pentylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 1.70% 2-Pentylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 1.70% 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.58% YES 1.70% 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 10 6173-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 2	23			6172-A2	0.000029	1.00E-03	2.94%		
23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 12 6172-E1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000028 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A2 0.000028 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 12 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 12 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 12 6173-E1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000029 1.00E-03 2.99% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000028 1.00E-03 2.82% YES 3.08% 23 2,5-Dimethylfuran 14 6172-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 2 6172-A2 0.00016 0.00100 1.59% YES 1.70% 2-Pentylfuran 16 6172-H2 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 16 6172-H2 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran 19 6172-E1 0.000016 0.00100 1.59% YES 1.70% 2-Pentylfuran	23	2,5-Dimethylfuran	4	6172-B1	0.000026	1.00E-03	2.64%	YES	3.08%
23 2,5-Dimethylfuran 10 6172-E1 0.000029 1.00E-03 2.88% YES 3.08% 23 2,5-Dimethylfuran 14 6172-G1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 16 6172-H2 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000028 1.00E-03 2.87% YES 3.08% 23 2,5-Dimethylfuran 16 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 2 6173-A1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-H1 0.000029 1.00E-03 2.89% YES 3.08% 23 2,5-Dimethylfuran 4 6173-B1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 6 6173-C1 0.000029 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 8 6173-D1 0.000031 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000031 1.00E-03 2.86% YES 3.08% 23 2,5-Dimethylfuran 10 6173-E1 0.000031 1.00E-03 2.96% YES 3.08% 23 2,5-Dimethylfuran 12 6173-F1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 12 6173-F1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 12 6173-F1 0.000029 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 14 6173-G1 0.000028 1.00E-03 2.91% YES 3.08% 23 2,5-Dimethylfuran 14 6173-H2 0.000028 1.00E-03 2.83% YES 3.08% 23 2,5-Dimethylfuran 14 6173-H2 0.000028 1.00E-03 2.83% YES 3.08% 23 2,5-Dimethylfuran 14 6173-H2 0.000028 1.00E-03 2.82% YES 3.08% 23 2,5-Dimethylfuran 14 6173-H2 0.000016 0.00100 1.97% 1.70%	23	2,5-Dimethylfuran	6	6172-C1	0.000027	1.00E-03	2.75%	YES	3.08%
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27 2-Pentylfuran 16 6172-H1 0.000016 0.00100 1.58% YES 1.70% 27 2-Pentylfuran 2 6172-A2 0.000016 0.00100 1.61% YES 1.70% 27 2-Pentylfuran 4 6172-B1 0.000017 0.00100 1.66% 1.70% 27 2-Pentylfuran 6 6172-C1 0.000015 0.00100 1.51% YES 1.70% 27 2-Pentylfuran 8 6172-D1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.58% YES 1.70% 27 2-Pentylfuran 12 6172-F1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 16 6173-H1 0.000016 0.00100 1.57% YES	27	2-Pentulfuran	2	6172-A1	0.000030	0.00100	1 07%		1 70%
27 2-Pentylfuran 2 6172-A2 0.000016 0.00100 1.61% YES 1.70% 27 2-Pentylfuran 4 6172-B1 0.000017 0.00100 1.66% 1.70% 27 2-Pentylfuran 6 6172-C1 0.000015 0.00100 1.51% YES 1.70% 27 2-Pentylfuran 8 6172-D1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 10 6172-E1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 12 6172-F1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 14 6172-G1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 16 6172-H2 0.000016 0.00100 1.58% YES 1.70% 27 2-Pentylfuran 2 6173-A1 0.000016 0.00100 1.57% YES 1.70% 27 2-Pentylfuran 16 6173-H1 0.000016								VFS	
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27 2-Pentylfuran 2 6173-A1 0.000016 0.00100 1.57% YES 1.70% 27 2-Pentylfuran 16 6173-H1 0.000016 0.00100 1.59% YES 1.70% 27 2-Pentylfuran 2 6173-A2 0.000016 0.00100 1.63% YES 1.70% 27 2-Pentylfuran 4 6173-B1 0.000016 0.00100 1.60% YES 1.70%									
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27 2-Pentylfuran 2 6173-A2 0.000016 0.00100 1.63% YES 1.70% 27 2-Pentylfuran 4 6173-B1 0.000016 0.00100 1.60% YES 1.70%	27	2-Pentylfuran		6173-A1	0.000016	0.00100	1.57%	YES	1.70%
27 2-Pentylfuran 4 6173-B1 0.000016 0.00100 1.60% YES 1.70%		and the same of th			0.000016				1.70%
27 2-Pentylfuran 6 6173-C1 0.000016 0.00100 1.62% 1.70%								YES	
	27	2-Pentylfuran	6	6173-C1	0.000016	0.00100	1.62%		1.70%

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL
27	2-Pentylfuran	8	6173-D1	0.000017	0.00100	1.70%	YES	(%OEL) 1.70%
27	2-Pentylfuran	10	6173-E1	0.000027	0.00100	2.73%	120	1.70%
27	2-Pentylfuran	12	6173-F1	0.000016	0.00100	1.60%	YES	1.70%
27	2-Pentylfuran	14	6173-G1	0.000016	0.00100	1.55%	YES	1.70%
27	2-Pentylfuran	16	6173-H2	0.000015	0.00100	1.55%	YES	1.70%
28	2-Heptylfuran	2	6172-A1	0.000016	0.00100	1.63%		1.06%
28	2-Heptylfuran	16	6172-H1	0.000010	0.00100	1.04%	YES	1.06%
28	2-Heptylfuran	2	6172-A2	0.000013	0.00100	1.34%		1.06%
28	2-Heptylfuran	4	6172-B1	0.000013	0.00100	1.28%		1.06%
28	2-Heptylfuran	6	6172-C1	0.000011	0.00100	1.07%		1.06%
28	2-Heptylfuran	8	6172-D1	0.000014	0.00100	1.36%		1.06%
28	2-Heptylfuran	10	6172-E1	0.000010	0.00100	1.05%	YES	1.06%
28	2-Heptylfuran	12	6172-F1	0.000011	0.00100	1.05%	YES	1.06%
28	2-Heptylfuran	14	6172-G1	0.000011	0.00100	1.05%	YES	1.06%
28	2-Heptylfuran	16	6172-H2	0.000010	0.00100	1.04%	YES	1.06%
28	2-Heptylfuran	2	6173-A1	0.000013	0.00100	1.34%		1.06%
28	2-Heptylfuran	16	6173-H1	0.000010	0.00100	1.05%	YES	1.06%
28	2-Heptylfuran	2	6173-A2	0.000011	0.00100	1.12%		1.06%
28	2-Heptylfuran	4	6173-B1	0.000014	0.00100	1.45%		1.06%
28 28	2-Heptylfuran	6 8	6173-C1 6173-D1	0.000018 0.000018	0.00100	1.81% 1.82%		1.06%
28	2-Heptylfuran	10	6173-D1	0.000018	0.00100 0.00100	1.15%		1.06%
28	2-Heptylfuran 2-Heptylfuran	12	6173-E1	0.000012	0.00100	1.06%	YES	1.06%
28	2-Heptylfuran	14	6173-F1	0.000011	0.00100	1.03%	YES	1.06%
28	2-Heptylfuran	16	6173-G1	0.000010	0.00100	1.02%	YES	1.06%
20	z-neptylidiali	10	01/3-HZ	0.000010	0.00100	1.02%	1123	1.00%
29	2-Propylfuran	2	6172-A1	0.000025	0.00100	2.47%	YES	2.75%
29	2-Propylfuran	16	6172-H1	0.000034	0.00100	3.37%		2.75%
29	2-Propylfuran	2	6172-A2	0.000026	0.00100	2.62%	YES	2.75%
29	2-Propylfuran	4	6172-B1	0.000024	0.00100	2.35%	YES	2.75%
29	2-Propylfuran	6	6172-C1	0.000025	0.00100	2.45%	YES	2.75%
29	2-Propylfuran	8	6172-D1	0.000026	0.00100	2.58%	YES	2.75%
29	2-Propylfuran	10	6172-E1	0.000026	0.00100	2.57%	YES	2.75%
29	2-Propylfuran	12	6172-F1	0.000026	0.00100	2.58%	YES	2.75%
29	2-Propylfuran	14	6172-G1	0.000026	0.00100	2.59%	YES	2.75%
29 29	2-Propylfuran	16 2	6172-H2 6173-A1	0.000026 0.000025	0.00100 0.00100	2.56%	YES	2.75% 2.75%
29	2-Propylfuran 2-Propylfuran	16	6173-A1	0.000025	0.00100	2.58%	YES	2.75%
29	2-Propylfuran	2	6173-H1	0.000026	0.00100	2.65%	YES	2.75%
29	2-Propylfuran	4	6173-B1	0.000026	0.00100	2.60%	YES	2.75%
29	2-Propylfuran	6	6173-C1	0.000026	0.00100	2.56%	YES	2.75%
29	2-Propylfuran	8	6173-D1	0.000028	0.00100	2.75%	YES	2.75%
29	2-Propylfuran	10	6173-E1	0.000026	0.00100	2.64%	YES	2.75%
29	2-Propylfuran	12	6173-F1	0.000026	0.00100	2.60%	YES	2.75%
29	2-Propylfuran	14	6173-G1	0.000025	0.00100	2.52%	YES	2.75%
29	2-Propylfuran	16	6173-H2	0.000025	0.00100	2.51%	YES	2.75%
33	Diethylphthalate	2	6172-A1	0.0002	0.55010	0.039%	YES	0.127%
33	Diethylphthalate	16	6172-H1	0.0002	0.55010	0.037%	YES	0.127%
33	Diethylphthalate	2	6172-A2	0.0002	0.55010	0.035%	YES	0.127%
33	Diethylphthalate	4	6172-B1	0.0002	0.55010	0.037%	YES	0.127%
33	Diethylphthalate	6	6172-C1	0.0002	0.55010	0.036%	YES	0.127%
33	Diethylphthalate	8	6172-D1	0.0002	0.55010	0.037%	YES	0.127%
33	Diethylphthalate	10	6172-E1	0.0002	0.55010	0.038%	YES	0.127%
33	Diethylphthalate	12	6172-F1	0.0002	0.55010	0.037%	YES	0.127%
33	Diethylphthalate	14	6172-G1	0.0002	0.55010	0.038%	YES	0.127%
33	Diethylphthalate	16	6172-H2	0.0002	0.55010	0.037%	YES	0.127%
33	Diethylphthalate	2	6173-A1	0.0004	0.55010	0.067%	YES	0.127%
33	Diethylphthalate	16	6173-H1	0.0007	0.55010	0.127%	YES	0.127%
33	Diethylphthalate	2	6173-A2	0.0002	0.55010	0.040%	YES	0.127%
33	Diethylphthalate	4	6173-B1	0.0002	0.55010	0.040%	YES	0.127%

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
33	Diethylphthalate	6	6173-C1	0.0002	0.55010	0.039%	YES	0.127%
33	Diethylphthalate	8	6173-D1	0.0002	0.55010	0.040%	YES	0.127%
33	Diethylphthalate	10	6173-E1	0.0002	0.55010	0.039%	YES	0.127%
33	Diethylphthalate	12	6173-F1	0.0002	0.55010	0.038%	YES	0.127%
33	Diethylphthalate	14	6173-G1		0.55010			0.127%
33	Diethylphthalate	16	6173-H2	0.0004	0.55010	0.079%	YES	0.127%
34	Acetonitrile	2	6172-A1	0.042	20.00000	0.211%		0.001%
34	Acetonitrile	16	6172-H1	0.139	20.00000	0.694%		0.001%
34	Acetonitrile	2	6172-A2	0.016	20.00000	0.081%		0.001%
34	Acetonitrile	4	6172-B1	0.051	20.00000	0.255%		0.001%
34	Acetonitrile	6	6172-C1	0.067	20.00000	0.335%		0.001%
34	Acetonitrile	8	6172-D1	0.292	20.00000	1.46%		0.001%
34	Acetonitrile	10	6172-E1	0.071	20.00000	0.357%		0.001%
34	Acetonitrile	12	6172-F1	0.075	20.00000	0.375%		0.001%
34	Acetonitrile	14	6172-G1	0.100	20.00000	0.501%		0.001%
34	Acetonitrile	16	6172-H2	0.097	20.00000	0.487%		0.001%
34	Acetonitrile	2	6173-A1		20.00000			0.001%
34	Acetonitrile	16	6173-H1	0.095	20.00000	0.475%		0.001%
34	Acetonitrile	2	6173-A2		20.00000			0.001%
34	Acetonitrile	4	6173-B1	0.097	20.00000	0.486%		0.001%
34	Acetonitrile	6	6173-C1	0.131	20.00000	0.655%		0.001%
34	Acetonitrile	8 10	6173-D1	2.480	20.00000	12.4%		0.001%
34 34	Acetonitrile Acetonitrile	10	6173-E1	0.086	20.00000	0.432%		0.001%
34	Acetonitrile	14	6173-F1 6173-G1	0.082 0.152	20.00000	0.411% 0.761%		0.001%
34	Acetonitrile	16	6173-G1 6173-H2	0.132	20.00000 20.00000	0.873%		0.001%
54	Acetonitrile	16	61/3-HZ	0.175	20.00000	0.673%		0.001%
35	Propanenitrile	2	6172-A1	0.0037	6.00000	0.062%		0.004%
35	Propanenitrile	16	6172-H1	0.0040	6.00000	0.066%		0.004%
35	Propanenitrile	2	6172-A2	0.0002	6.00000	0.004%	YES	0.004%
35	Propanenitrile	4	6172-B1	0.0002	6.00000	0.004%	YES	0.004%
35	Propanenitrile	6	6172-C1	0.0003	6.00000	0.005%		0.004%
35	Propanenitrile	8	6172-D1	0.0007	6.00000	0.012%		0.004%
35	Propanenitrile	10	6172-E1	0.0018	6.00000	0.030%		0.004%
35	Propanenitrile	12	6172-F1	0.0026	6.00000	0.043%		0.004%
35 35	Propanenitrile	14 16	6172-G1	0.0025 0.0026	6.00000	0.041%		0.004%
35	Propanenitrile Propanenitrile	2	6172-H2 6173-A1	0.0026	6.00000	0.043%		0.004%
35	Propanenitrile Propanenitrile	16	6173-A1 6173-H1	0.0037	6.00000	0.062%		0.004%
35	Propanenitrile Propanenitrile	2	6173-A2	0.0057	6.00000	0.062%		0.004%
35	Propanenitrile	4	6173-A2	0.0003	6.00000	0.006%		0.004%
35	Propanenitrile	6	6173-C1	0.0003	6.00000	0.012%		0.004%
35	Propanenitrile	8	6173-D1	0.0009	6.00000	0.016%		0.004%
35	Propanenitrile	10	6173-E1	0.0017	6.00000	0.028%		0.004%
35	Propanenitrile	12	6173-F1	0.0014	6.00000	0.024%		0.004%
35	Propanenitrile	14	6173-G1	0.0025	6.00000	0.041%		0.004%
35	Propanenitrile	16	6173-H2	0.0017	6.00000	0.028%		0.004%
36	Butanenitrile	2	6172-A1	0.0034	8.00000	0.043%		0.003%
36	Butanenitrile	16	6172-H1	0.0027	8.00000	0.034%		0.003%
36	Butanenitrile	2	6172-H1	0.0002	8.00000	0.003%	YES	0.003%
36	Butanenitrile	4	6172-B1	0.0002	8.00000	0.003%	YES	0.003%
36	Butanenitrile	6	6172-C1	0.0002	8.00000	0.002%	YES	0.003%
36	Butanenitrile	8	6172-D1	0.0002	8.00000	0.003%	YES	0.003%
36	Butanenitrile	10	6172-E1	0.0002	8.00000	0.002%	YES	0.003%
36	Butanenitrile	12	6172-F1	0.0002	8.00000	0.002%	YES	0.003%
36	Butanenitrile	14	6172-G1	0.0002	8.00000	0.002%	YES	0.003%
36	Butanenitrile	16	6172-H2	0.0002	8.00000	0.002%	YES	0.003%
-			6173-A1		8.00000			0.003%
36	Butanenitrile	2	01/2-MI		0.00000			0.00370
36 36	Butanenitrile Butanenitrile	16	6173-H1	0.0020	8.00000	0.025%		0.003%

	9.00	et des les	n 21	[6] F	ori (F	Measurement	Approx. DL
COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	< DL?	(%OEL)
36	Butanenitrile	4	6173-B1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	6	6173-C1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	8	6173-D1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	10	6173-E1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	12	6173-F1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	14	6173-G1	0.0001	8.00000	0.001%	YES	0.003%
36	Butanenitrile	16	6173-H2	0.0001	8.00000	0.001%	YES	0.003%
	S 1 22		6470 44	0.000		0.04.50/		0.0040/
37 37	Pentanenitrile	2	6172-A1 6172-H1	0.0009	6.00000	0.015%		0.004%
37	Pentanenitrile Pentanenitrile	16 2	6172-H1	0.0004 0.0002	6.00000 6.00000	0.007%	YES	0.004%
37	Pentanenitrile	4	6172-A2	0.0002	6.00000	0.004%	YES	0.004%
37	Pentanenitrile	6	6172-C1	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	8	6172-D1	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	10	6172-E1	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	12	6172-F1	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	14	6172-G1	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	16	6172-H2	0.0002	6.00000	0.003%	YES	0.004%
37	Pentanenitrile	2	6173-A1	010002	6.00000	0100070	123	0.004%
37	Pentanenitrile	16	6173-H1	0.0006	6.00000	0.010%		0.004%
37	Pentanenitrile	2	6173-A2		6.00000			0.004%
37	Pentanenitrile	4	6173-B1	0.0001	6.00000	0.002%	YES	0.004%
37	Pentanenitrile	6	6173-C1	0.0001	6.00000	0.002%	YES	0.004%
37	Pentanenitrile	8	6173-D1	0.0001	6.00000	0.002%	YES	0.004%
37	Pentanenitrile	10	6173-E1	0.0003	6.00000	0.006%		0.004%
37	Pentanenitrile	12	6173-F1	0.0001	6.00000	0.002%	YES	0.004%
37	Pentanenitrile	14	6173-G1	0.0001	6.00000	0.002%	YES	0.004%
37	Pentanenitrile	16	6173-H2	0.0001	6.00000	0.002%	YES	0.004%
38	Hexanenitrile	2	6172-A1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	16	6172-H1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	2	6172-A2	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	4	6172-B1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	6	6172-C1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	8	6172-D1	0.0002	6,00000	0.003%	YES	0.003%
38	Hexanenitrile	10	6172-E1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	12	6172-F1	0.0002	6.00000	0.003%		0.003%
38	Hexanenitrile	14	6172-G1	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	16	6172-H2	0.0002	6.00000	0.003%	YES	0.003%
38	Hexanenitrile	2	6173-A1		6.00000			0.003%
38	Hexanenitrile	16	6173-H1	0.0001	6.00000	0.002%		0.003%
38	Hexanenitrile	2	6173-A2		6.00000			0.003%
38	Hexanenitrile	4	6173-B1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	6	6173-C1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	8	6173-D1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	10	6173-E1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	12	6173-F1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	14	6173-G1	0.0001	6.00000	0.002%	YES	0.003%
38	Hexanenitrile	16	6173-H2	0.0001	6.00000	0.002%	YES	0.003%
42	Ethylamine	2	6172-A1	0.0045	5.00000	0.091%	YES	0.10%
42	Ethylamine	16	6172-H1	0.0168	5.00000	0.337%	123	0.10%
42	Ethylamine	2	6172-A2	0.0045	5.00000	0.090%	YES	0.10%
42	Ethylamine	4	6172-A2	0.0047	5.00000	0.095%	YES	0.10%
42	Ethylamine	6	6172-C1	0.0047	5.00000	0.092%	YES	0.10%
42	Ethylamine	8	6172-D1	0.0047	5.00000	0.092%	YES	0.10%
42	Ethylamine	10	6172-E1	0.0047	5.00000	0.095%	YES	0.10%
42	Ethylamine	12	6172-F1	0.0047	5.00000	0.094%	YES	0.10%
42	Ethylamine	14	6172-G1	0.0048	5.00000	0.095%	YES	0.10%
42	Ethylamine	16	6172-H2	0.0046	5.00000	0.092%	YES	0.10%
42	Ethylamine	2	6173-A1	0.0046	5.00000	0.092%	YES	0.10%
42	Ethylamine	16	6173-H1	0.0047	5.00000	0.093%	YES	0.10%
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COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement	Approx. DL
COPC#	•			conc. (ppm)	OEL (ppm)		< DL?	(%OEL)
42	Ethylamine	2	6173-A2	0.0046	5.00000	0.091%	YES	0.10%
42	Ethylamine	4	6173-B1	0.0046	5.00000	0.091%	YES	0.10%
42	Ethylamine	6	6173-C1	0.0047	5.00000	0.094%	YES	0.10%
42	Ethylamine	8	6173-D1	0.0048	5.00000	0.097%	YES	0.10%
42	Ethylamine	10	6173-E1	0.0049	5.00000	0.097%	YES	0.10%
42	Ethylamine	12	6173-F1	0.0049	5.00000	0.097%	YES	0.10%
42	Ethylamine	14	6173-G1	0.0048	5.00000	0.095%	YES	0.10%
42	Ethylamine	16	6173-H2	0.0046	5.00000	0.092%	YES	0.10%
43	N-Nitrosodimethylamine	2	6172-A1	0.00067	0.00030	224%		8.40%
43	N-Nitrosodimethylamine	16	6172-H1	0.00052	0.00030	173%		8.40%
43	N-Nitrosodimethylamine	2	6172-A2	0.00002	0.00030	7.00%	YES	8.40%
43	N-Nitrosodimethylamine	4	6172-B1	0.00002	0.00030	6.97%	YES	8.40%
43	N-Nitrosodimethylamine	6	6172-C1	0.00002	0.00030	6.63%	YES	8.40%
43	N-Nitrosodimethylamine	8	6172-D1	0.00003	0.00030	8.40%	YES	8.40%
43	N-Nitrosodimethylamine	10	6172-E1	0.00002	0.00030	6.73%	YES	8.40%
43	N-Nitrosodimethylamine	12	6172-F1	0.00002	0.00030	6.73%	YES	8.40%
43	N-Nitrosodimethylamine	14	6172-G1	0.00002	0.00030	6.80%	YES YES	8.40%
43	N-Nitrosodimethylamine	16 2	6172-H2 6173-A1	0.00002 0.00013	0.00030	6.87%	YES	8.40%
43 43	N-Nitrosodimethylamine N-Nitrosodimethylamine	16	6173-A1 6173-H1		0.00030	43.0%		8.40% 8.40%
43		2	6173-H1	0.00056 0.00002	0.00030 0.00030	187% 6.90%	YES	8.40%
43	N-Nitrosodimethylamine N-Nitrosodimethylamine	4	6173-AZ	0.00002	0.00030	6.90%	YES	8.40%
43	N-Nitrosodimethylamine	6	6173-61 6173-C1	0.00002	0.00030	6.97%	YES	8.40%
43	N-Nitrosodimethylamine	8	6173-C1	0.00002	0.00030	6.90%	YES	8.40%
43	N-Nitrosodimethylamine	10	6173-E1	0.00002	0.00030	6.90%	YES	8.40%
43	N-Nitrosodimethylamine	12	6173-E1	0.00002	0.00030	12.1%	YES	12.13%
43	N-Nitrosodimethylamine	14	6173-G1	0.00004	0.00030	12.1%	YES	12.13%
43	N-Nitrosodimethylamine	16	6173-H2	0.00004	0.00030	12.1%	YES	12.13%
45	N-Niti Osoumictily lamine		01/5-112	0.00004	0.00030	12.170	123	12.1570
44	N-Nitrosodiethylamine	2	6172-A1	0.00002	0.00010	23.4%	YES	28.70%
44	N-Nitrosodiethylamine	16	6172-H1	0.00005	0.00010	52.3%		28.70%
44	N-Nitrosodiethylamine	2	6172-A2	0.00002	0.00010	23.9%	YES	28.70%
44	N-Nitrosodiethylamine	4	6172-B1	0.00002	0.00010	23.8%	YES	28.70%
44	N-Nitrosodiethylamine	6	6172-C1	0.00002	0.00010	22.7%	YES	28.70%
44	N-Nitrosodiethylamine	8	6172-D1	0.00003	0.00010	28.7%	YES	28.70%
44	N-Nitrosodiethylamine	10	6172-E1	0.00002	0.00010	23.0%	YES	28.70%
44	N-Nitrosodiethylamine	12	6172-F1	0.00002	0.00010	23.0%	YES	28.70%
44	N-Nitrosodiethylamine	14	6172-G1	0.00002	0.00010	23.2%	YES	28.70%
44	N-Nitrosodiethylamine	16	6172-H2	0.00002	0.00010	23.5%	YES	28.70%
44	N-Nitrosodiethylamine	2	6173-A1	0.00007	0.00010	73.6%		28.70%
44	N-Nitrosodiethylamine	16	6173-H1	0.00005	0.00010	49.1%	lum.	28.70%
44	N-Nitrosodiethylamine	2	6173-A2	0.00002	0.00010	23.6%	YES	28.70%
44	N-Nitrosodiethylamine	4	6173-B1	0.00002	0.00010	23.5%	YES	28.70%
44	N-Nitrosodiethylamine	6	6173-C1	0.00002	0.00010	23.8%	YES	28.70%
44	N-Nitrosodiethylamine	8	6173-D1	0.00002	0.00010	23.6%	YES	28.70%
44	N-Nitrosodiethylamine	10	6173-E1	0.00002	0.00010	23.6%	YES	28.70%
44	N-Nitrosodiethylamine	12	6173-F1	0.00002	0.00010	23.2%	YES	28.70%
44	N-Nitrosodiethylamine	14	6173-G1	0.00002	0.00010	23.2%	YES	28.70%
44	N-Nitrosodiethylamine	16	6173-H2	0.00002	0.00010	23.2%	YES	28.70%
45	N-Nitrosomethylethylamine	2	6172-A1	0.00003	0.00030	8.62%	YES	11.09%
45	N-Nitrosomethylethylamine	16	6172-H1	0.00003	0.00030	8.89%	YES	11.09%
45	N-Nitrosomethylethylamine	2	6172-A2	0.00003	0.00030	9.23%	YES	11.09%
45	N-Nitrosomethylethylamine	4	6172-B1	0.00003	0.00030	9.21%	YES	11.09%
45	N-Nitrosomethylethylamine	6	6172-C1	0.00003	0.00030	8.77%	YES	11.09%
45	N-Nitrosomethylethylamine	8	6172-D1	0.00003	0.00030	11.1%	YES	11.09%
45	N-Nitrosomethylethylamine	10	6172-E1	0.00003	0.00030	8.89%	YES	11.09%
45	N-Nitrosomethylethylamine	12	6172-F1	0.00003	0.00030	8.89%	YES	11.09%
45	N-Nitrosomethylethylamine	14	6172-G1	0.00003	0.00030	8.97%	YES	11.09%
45	N-Nitrosomethylethylamine	16	6172-H2	0.00003	0.00030	9.06%	YES	11.09%
45	N-Nitrosomethylethylamine	2	6173-A1	0.00003	0.00030	9.07%	YES	11.09%

		# 1# Pr			are t	B 11 25-	Measurement	Approx. DL
COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	< DL?	(%OEL)
45	N-Nitrosomethylethylamine	16	6173-H1	0.00003	0.00030	8.89%	YES	11.09%
45	N-Nitrosomethylethylamine	2	6173-A2	0.00003	0.00030	9.12%	YES	11.09%
45	N-Nitrosomethylethylamine	4	6173-B1	0.00003	0.00030	9.10%	YES	11.09%
45	N-Nitrosomethylethylamine	6	6173-C1	0.00003	0.00030	9.19%	YES	11.09%
45	N-Nitrosomethylethylamine	8	6173-D1	0.00003	0.00030	9.10%	YES	11.09%
45	N-Nitrosomethylethylamine	10	6173-E1	0.00003	0.00030	9.13%	YES	11.09%
45	N-Nitrosomethylethylamine	12	6173-F1	0.00003	0.00030	8.97%	YES	11.09%
45	N-Nitrosomethylethylamine	14	6173-G1	0.00003	0.00030	8.96%	YES	11.09%
45	N-Nitrosomethylethylamine	16	6173-H2	0.00003	0.00030	8.97%	YES	11.09%
46	N-Nitrosomorpholine	2	6172-A1	0.00002	0.00060	3.43%	YES	3.33%
46	N-Nitrosomorpholine	16	6172-H1	0.00002	0.00060	3.37%	YES	3.33%
46	N-Nitrosomorpholine	2	6172-A2	0.00002	0.00060	3.50%	YES	3.33%
46	N-Nitrosomorpholine	4	6172-B1	0.00002	0.00060	3.50%	YES	3.33%
46	N-Nitrosomorpholine	6	6172-C1	0.00002	0.00060	3.33%	YES	3.33%
46	N-Nitrosomorpholine	8	6172-D1	0.00003	0.00060	4.20%	YES	3.33%
46	N-Nitrosomorpholine	10	6172-E1	0.00002	0.00060	3.37%	YES	3.33%
46	N-Nitrosomorpholine	12	6172-F1	0.00002	0.00060	3.37%	YES	3.33%
46	N-Nitrosomorpholine	14	6172-G1	0.00002	0.00060	3.40%	YES	3.33%
46	N-Nitrosomorpholine	16	6172-H2	0.00002	0.00060	3.43%	YES	3.33%
46	N-Nitrosomorpholine	2	6173-A1	0.00004	0.00060	7.20%		3.33%
46	N-Nitrosomorpholine	16 2	6173-H1 6173-A2	0.00005	0.00060	7.97%	YES	3.33%
46 46	N-Nitrosomorpholine N-Nitrosomorpholine	4	6173-A2 6173-B1	0.00002	0.00060	3.47%	YES	3.33% 3.33%
46	N-Nitrosomorpholine	6	6173-B1	0.00002 0.00002	0.00060	3.45%	YES	3.33%
46	N-Nitrosomorpholine	8	6173-C1 6173-D1	0.00002	0.00060	3.45%	YES	3.33%
46	N-Nitrosomorpholine	10	6173-D1	0.00002	0.00060	3.47%	YES	3.33%
46	N-Nitrosomorpholine	12	6173-E1	0.00002	0.00060	3.25%	YES	3.33%
46	N-Nitrosomorpholine	14	6173-G1	0.00002	0.00060	3.25%	YES	3.33%
46	N-Nitrosomorpholine	16	6173-G1	0.00002	0.00060	3.25%	YES	3.33%
40	14-14ttr Osomor phomic	10	01/5-112	0.00002	0.00000	5.2570	123	3.3370
47	Tributyl phosphate	2	6172-A1	0.00014	0.20000	0.071%	YES	0.23%
47	Tributyl phosphate	16	6172-H1	0.00014	0.20000	0.069%	YES	0.23%
47	Tributyl phosphate	2	6172-A2	0.00013	0.20000	0.065%	YES	0.23%
47	Tributyl phosphate	4	6172-B1	0.00014	0.20000	0.068%	YES	0.23%
47	Tributyl phosphate	6	6172-C1	0.00013	0.20000	0.065%	YES	0.23%
47	Tributyl phosphate	8	6172-D1	0.00014	0.20000	0.068%	YES	0.23%
47	Tributyl phosphate	10	6172-E1	0.00014	0.20000	0.070%	YES	0.23%
47	Tributyl phosphate	12	6172-F1	0.00014	0.20000	0.068%	YES	0.23%
47	Tributyl phosphate	14	6172-G1	0.00014	0.20000	0.069%	YES	0.23%
47	Tributyl phosphate	16	6172-H2	0.00013	0.20000	0.067%	YES	0.23%
47	Tributyl phosphate	2	6173-A1	0.00025	0.20000	0.123%	YES	0.23%
47	Tributyl phosphate	16	6173-H1	0.00047	0.20000	0.233%	YES	0.23%
47	Tributyl phosphate	2	6173-A2	0.00015	0.20000	0.074%	YES	0.23%
47	Tributyl phosphate	4	6173-B1	0.00015	0.20000	0.074%	YES	0.23%
47	Tributyl phosphate	6	6173-C1	0.00014	0.20000	0.071%	YES	0.23%
47	Tributyl phosphate	8	6173-D1	0.00015	0.20000	0.073%	YES	0.23%
47	Tributyl phosphate	10	6173-E1	0.00014	0.20000	0.071%	YES	0.23%
47	Tributyl phosphate	12	6173-F1	0.00014	0.20000	0.070%	YES	0.23%
47	Tributyl phosphate	14	6173-G1		0.20000			0.23%
47	Tributyl phosphate	16	6173-H2	0.00029	0.20000	0.145%	YES	0.23%
48	Dibutyl butylphosphonate	2	6172-A1	0.00010	0.00700	1.38%	YES	4.54%
48	Dibutyl butylphosphonate	16	6172-H1	0.00009	0.00700	1.34%	YES	4.54%
48	Dibutyl butylphosphonate	2	6172-A2	0.00009	0.00700	1.27%	YES	4.54%
48	Dibutyl butylphosphonate	4	6172-B1	0.00009	0.00700	1.33%	YES	4.54%
48	Dibutyl butylphosphonate	6	6172-C1	0.00009	0.00700	1.28%	YES	4.54%
48	Dibutyl butylphosphonate	8	6172-D1	0.00009	0.00700	1.32%	YES	4.54%
48	Dibutyl butylphosphonate	10	6172-E1	0.00010	0.00700	1.37%	YES	4.54%
48	Dibutyl butylphosphonate	12	6172-F1	0.00009	0.00700	1.33%	YES	4.54%
48	Dibutyl butylphosphonate	14	6172-G1	0.00009	0.00700	1.35%	YES	4.54%
48	Dibutyl butylphosphonate	16	6172-H2	0.00009	0.00700	1.32%	YES	4.54%

COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
48	Dibutyl butylphosphonate	2	6173-A1	0.00017	0.00700	2.40%	YES	4.54%
48	Dibutyl butylphosphonate	16	6173-H1	0.00032	0.00700	4.54%	YES	4.54%
48	Dibutyl butylphosphonate	2	6173-A2	0.00010	0.00700	1.45%	YES	4.54%
48	Dibutyl butylphosphonate	4	6173-B1	0.00010	0.00700	1.44%	YES	4.54%
48	Dibutyl butylphosphonate	6	6173-C1	0.00010	0.00700	1.38%	YES	4.54%
48	Dibutyl butylphosphonate	8	6173-D1	0.00010	0.00700	1.42%	YES	4.54%
48	Dibutyl butylphosphonate	10	6173-E1	0.00010	0.00700	1.39%	YES	4.54%
48	Dibutyl butylphosphonate	12	6173-F1	0.00010	0.00700	1.37%	YES	4.54%
48	Dibutyl butylphosphonate	14	6173-G1		0.00700			4.54%
48	Dibutyl butylphosphonate	16	6173-H2	0.00020	0.00700	2.83%	YES	4.54%
51	Pyridine	2	6172-A1	0.00157	1.00000	0.157%		0.03%
51	Pyridine	16	6172-H1	0.00139	1.00000	0.139%		0.03%
51	Pyridine	2	6172-A2	0.00024	1.00000	0.024%	YES	0.03%
51	Pyridine	4	6172-B1	0.00025	1.00000	0.025%	YES	0.03%
51	Pyridine	6	6172-C1	0.00023	1.00000	0.023%	YES	0.03%
51	Pyridine	8	6172-D1	0.00024	1.00000	0.024%	YES	0.03%
51	Pyridine	10	6172-E1	0.00023	1.00000	0.023%	YES	0.03%
51	Pyridine	12	6172-F1	0.00023	1.00000	0.023%	YES	0.03%
51	Pyridine	14	6172-G1	0.00023	1.00000	0.023%	YES	0.03%
51	Pyridine	16	6172-H2	0.00023	1.00000	0.023%	YES	0.03%
51	Pyridine	2	6173-A1		1.00000			0.03%
51	Pyridine	16	6173-H1	0.00044	1.00000	0.044%		0.03%
51	Pyridine	2	6173-A2		1.00000			0.03%
51	Pyridine	4	6173-B1	0.00032	1.00000	0.032%	YES	0.03%
51	Pyridine	6	6173-C1	0.00032	1.00000	0.032%	YES	0.03%
51	Pyridine	8	6173-D1	0.00033	1.00000	0.033%	YES	0.03%
51	Pyridine	10	6173-E1	0.00032	1.00000	0.032%	YES	0.03%
51	Pyridine	12	6173-F1	0.00032	1.00000	0.032%	YES	0.03%
51	Pyridine	14	6173-G1	0.00031	1.00000	0.031%	YES	0.03%
51	Pyridine	16	6173-H2	0.00031	1.00000	0.031%	YES	0.03%
52	2,4-Dimethylpyridine	2	6172-A1	0.00024	0.50000	0.047%	YES	0.06%
52	2,4-Dimethylpyridine	16	6172-H1	0.00028	0.50000	0.056%	YES	0.06%
52	2,4-Dimethylpyridine	2	6172-A2	0.00026	0.50000	0.053%	YES	0.06%
52	2,4-Dimethylpyridine	4	6172-B1	0.00027	0.50000	0.053%	YES	0.06%
52	2,4-Dimethylpyridine	6	6172-C1	0.00024	0.50000	0.049%	YES	0.06%
52	2,4-Dimethylpyridine	8	6172-D1	0.00026	0.50000	0.051%	YES	0.06%
52	2,4-Dimethylpyridine	10	6172-E1	0.00025	0.50000	0.050%	YES	0.06%
52	2,4-Dimethylpyridine	12	6172-F1	0.00025	0.50000	0.049%	YES	0.06%
52	2,4-Dimethylpyridine	14	6172-G1	0.00025	0.50000	0.049%	YES	0.06%
52	2,4-Dimethylpyridine	16	6172-H2	0.00025	0.50000	0.049%	YES	0.06%
52	2,4-Dimethylpyridine	2	6173-A1		0.50000			0.06%
52	2,4-Dimethylpyridine	16	6173-H1	0.00020	0.50000	0.041%	YES	0.06%
52	2,4-Dimethylpyridine	2	6173-A2		0.50000			0.06%
52	2,4-Dimethylpyridine	4	6173-B1	0.00021	0.50000	0.042%	YES	0.06%
52	2,4-Dimethylpyridine	6	6173-C1	0.00021	0.50000	0.041%	YES	0.06%
52	2,4-Dimethylpyridine	8	6173-D1	0.00021	0.50000	0.042%	YES	0.06%
52	2,4-Dimethylpyridine	10	6173-E1	0.00021	0.50000	0.041%	YES	0.06%
52	2,4-Dimethylpyridine	12	6173-F1	0.00020	0.50000	0.041%	YES	0.06%
52	2,4-Dimethylpyridine	14	6173-G1	0.00020	0.50000	0.040%	YES	0.06%
52	2,4-Dimethylpyridine	16	6173-H2	0.00020	0.50000	0.040%	YES	0.06%

Appendix E

Plots of Other COPCs with Significant (2–10% of OEL) Detected Values

Appendix E

Plots of Other COPCs with Significant (2–10% of OEL) Detected Values

1,3-Butadiene (see Figure E.1) – The detection limit (DL) for 1,3-Butadiene corresponds to ~2.4% of the OEL for the SCOTT 7422-SD1 cartridge and 2.6% of the OEL for the SCOTT 7422-SC1. All inlet and outlet concentrations for the two different respirator cartridges were <10% of the OEL, specifically <2.6% of the OEL. No evidence of breakthrough is observed in the data.

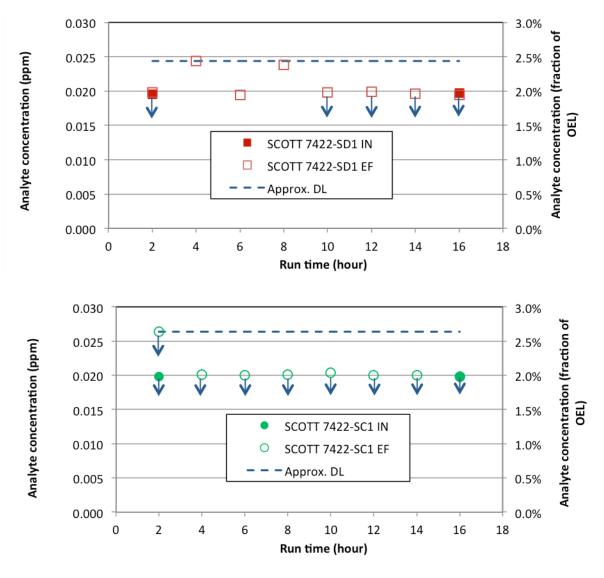


Figure E.1. Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL).

Formaldehyde (see Figure E.2) – The DL for formaldehyde is ~0.61% of its OEL. All inlet and outlet values measured for the two respirator cartridges were <10% of the OEL; specifically <5.2%. Inlet values for both respirator cartridges ranged between 1.7% and 5.2% of the OEL. The outlet measurements for both respirators were greater than the DL but <10% of the OEL for the early readings but decreased with time (like the inlet values). The latter outlet measurements for both cartridges were all less than the DL. This same trend was observed in prior tank analyses, suggesting possible environmental background interference. Nevertheless, more measurements are recommended, with higher inlet concentrations, to confirm this conclusion.

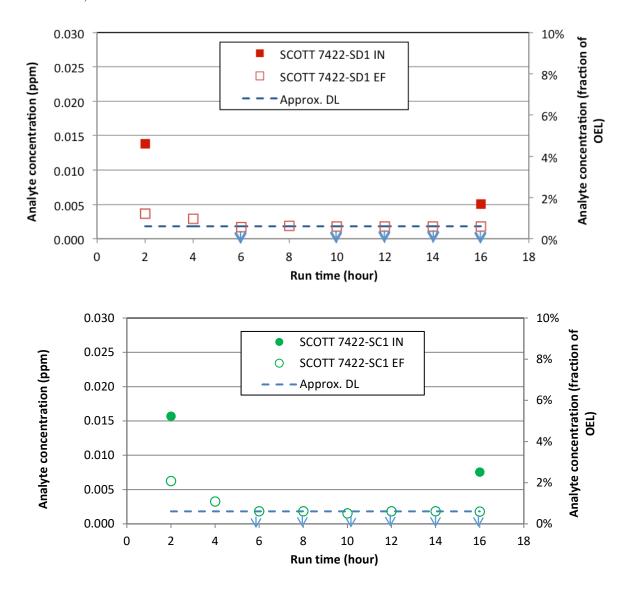


Figure E.2. Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Furan (see Figure E.3) – The DL for furan corresponds to ~0.9% of its OEL. All inlet and outlet values measured between the two respirator cartridges were <10% of the OEL; specifically <5%. The inlet values for both respirator cartridges ranged from 2.7% to 4.8% of the OEL. Outlet measurements for both respirator cartridges were less than the DL, with the exception of several measurements for the SCOTT 7422-SC1 cartridge that were slightly greater than the DL. The maximum of these values, occurring at the end of the test, was 1.3% of the OEL. This could suggest some breakthrough for that cartridge although the measurement variability is fairly consistent for furans. More measurements are recommended, with higher inlet concentrations, to better determine the behavior. Still, all of the measured inlet and outlet values were <5% of the OEL.

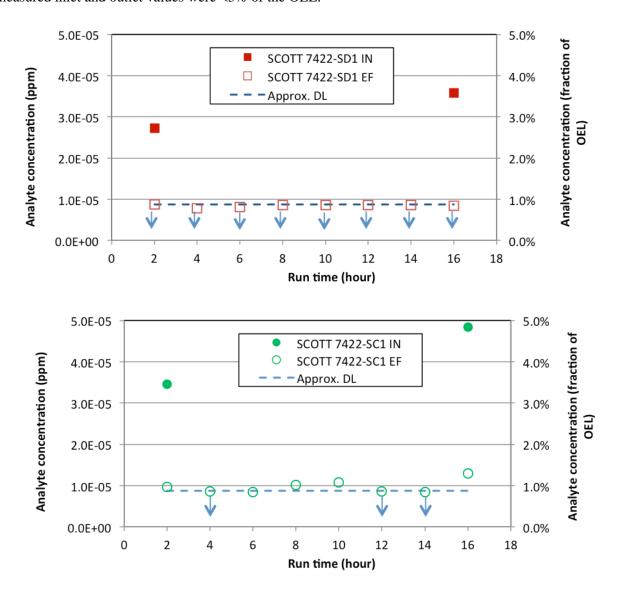


Figure E.3. Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2,3-Dihydrofuran (see Figure E.4) – The DL for 2,3-Dihydrofuran corresponds to ~1.8% of the OEL. Two initial inlet concentrations for the two different respirator cartridges had measurements above the DL (4.2% and 2.0% of the OEL, respectively). All other measurements were below the DL for 2,3-Dihydrofuran, with the exception of one outlet value for SCOTT 7422-SC1 during the 8-to-10-hour period (2.6% of the OEL). This elevated value could be due to measurement error. No evidence of breakthrough is observed in the data.

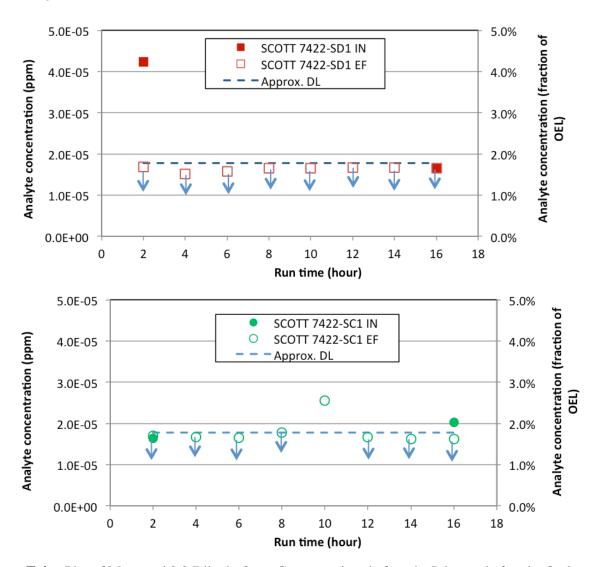


Figure E.4. Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2,5-Dihydrofuran (see Figure E.5) – The DL for 2,5-Dihydrofuran corresponds to ~2.2% of the OEL. All of the inlet and outlet concentrations were below the DL, with two exceptions—one outlet value for the SCOTT 7422-SD1 cartridge during the 8-to-10 hour period (2.4% of the OEL) and one outlet value for SCOTT 7422-SC1 during the 6-to-8-hour period (3.8% of the OEL). These elevated values could be due to measurement error. No evidence of breakthrough is observed in the data.

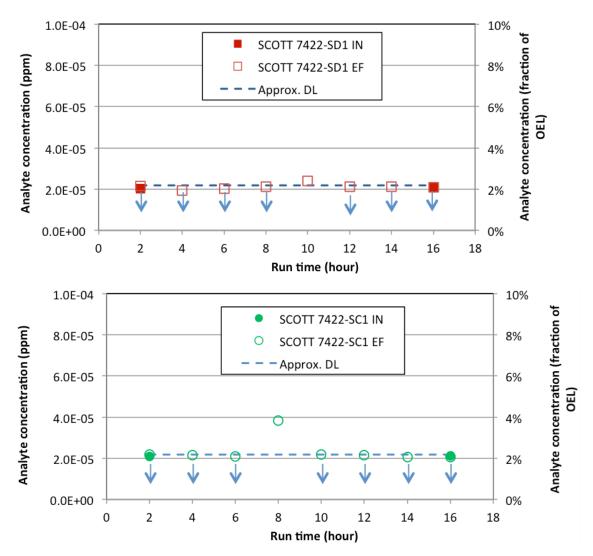


Figure E.5. Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Methylfuran (see Figure E.6) – The DL for 2-Methylfuran corresponds to ~1.9% of the OEL. All inlet values were less than the DL. All outlet measurements were below the DL, with the exception of one outlet value for SCOTT 7422-SD1 during the 8-to-10-hour period (2.1% of the OEL). This elevated value could be due to measurement error. No evidence of breakthrough is observed in the data.

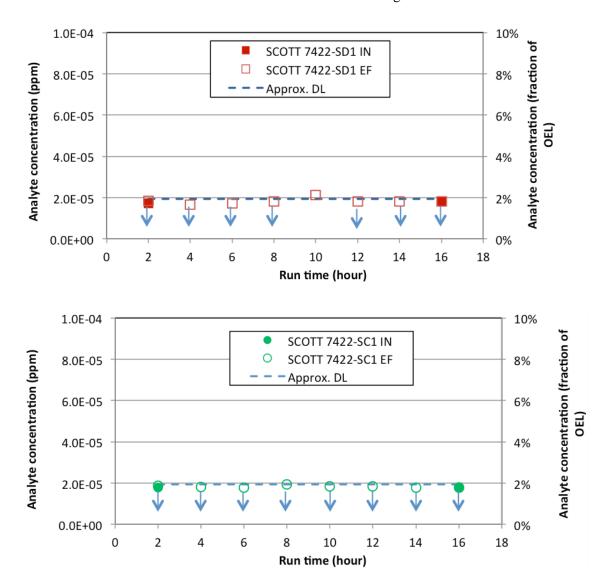


Figure E.6. Plot of Measured 2-Methylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2,5-Dimethylfuran (see Figure E.7) – The DL for 2,5-Dimethylfuran corresponds to ~3.1% of the OEL. All inlet and outlet values were less than DL. No evidence of breakthrough is observed in the data.

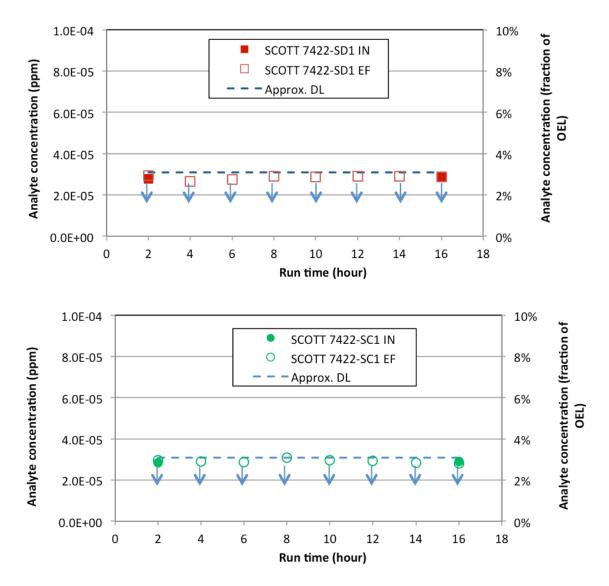


Figure E.7. Plot of Measured 2,5-Dimethylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Pentylfuran (see Figure E.8) – The DL for 2-Pentylfuran corresponds to ~1.7% of the OEL. All values (inlet and outlet) were <10% of the OEL; specifically <3%. Several inlet and outlet values were greater than the DL, but all of these were <2.7% of the OEL. One elevated outlet reading was observed for SCOTT 7422-SC1 during the 8-to-10-hour period (2.7% of the OEL). This value could be due to measurement error. Thus, there was no evidence of breakthrough is observed in the data.

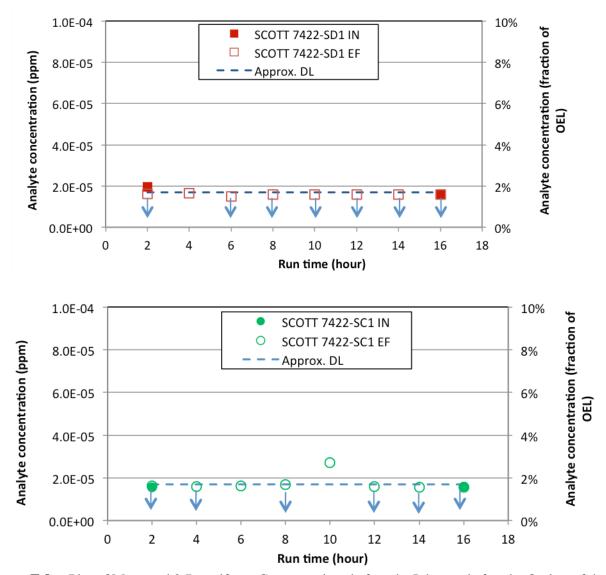


Figure E.8. Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Propylfuran (see Figure E.9) – The DL for 2-Propylfuran corresponds to ~2.8% of the OEL. All values (inlet and outlet) were <10% of the OEL; specifically <4%. All of the measured inlet and outlet values from both cartridges were less than the DL, except for the last inlet concentration for SCOTT 7422-SD1 (3.4% of the OEL). Thus, there was no evidence of breakthrough observed in the data.

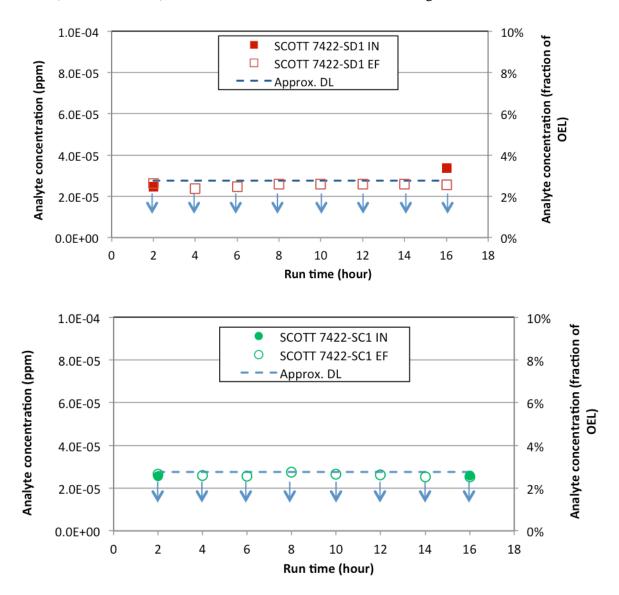


Figure E.9. Plot of Measured 2-Propylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosomorpholine (see Figure E.10) – The DL for N-Nitrosomorpholine corresponds to ~3.3% of the OEL. All the inlet and outlet values for SCOTT 7422-SD1 were below the DL. Both the inlet concentrations for SCOTT 7422-SC1 were greater than the DL (7.2% and 8.0%, respectively); however, none of the corresponding outlet measurements were greater than the DL. Therefore, there was no evidence of breakthrough over the measured time period for either cartridge.

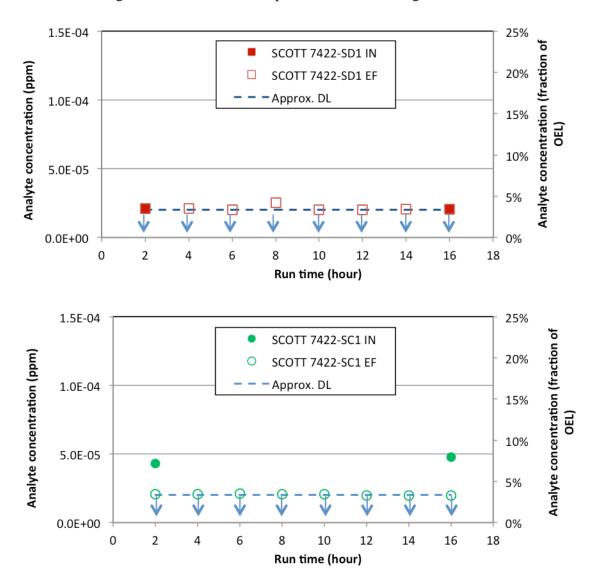


Figure E.10. Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Dibutyl butylphosphonate (see Figure E.11) – The DL for Dibutyl butylphosphonate corresponds to ~4.5% of the OEL. Two initial inlet concentrations for the SCOTT 7422-SD1 were similar (1.4% and 1.3% of the OEL, respectively) and are less than the DL; however, the two inlet concentrations for the SCOTT 7422-SC1 cartridge were a bit scattered but are less than the DL (2.4% and 4.5% of the OEL, respectively). All outlet values were less than the DL; therefore, no evidence of breakthrough is observed in the data.

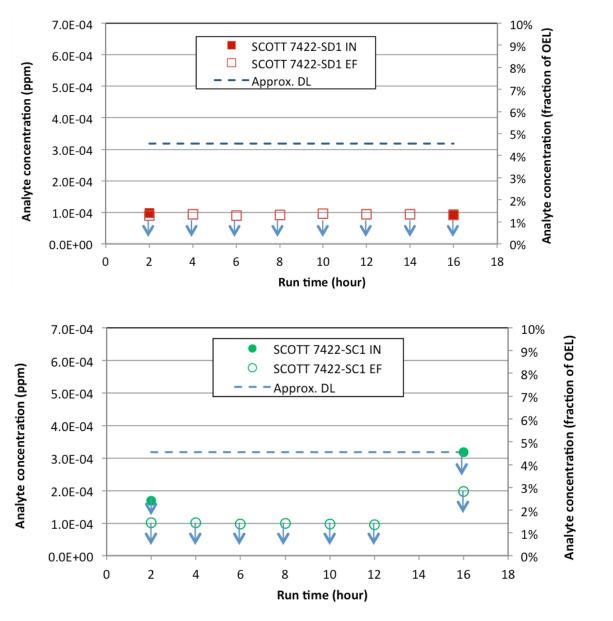


Figure E.11. Plot of Measured Dibutyl butylphosphonate Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Appendix F Historical Data Comparison

Appendix F

Historical Data Comparison

F.1 Data Sources

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 tank 241-A-101 (A-101) and its exhaust system were obtained via a TWINS query on June 20, 2016, for TWINS HS, (18) and another query on October 7, 2016, for TWINS IH. More recent headspace data were also obtained from the Site-Wide Industrial Hygiene Database (SWIHD) by two queries. The first query, on July 12, 2016, contained all data loaded as of that date. The second query contained all data with survey dates between May 1, 2016, and October 7, 2016. This latter data set was used to update and supplement the former, producing a set referred to as "SWIHD HS."

TWINS HS and TWINS IH data were eliminated from consideration if they met the following criteria:

- 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).

¹⁸ No data have been added to TWINS HS since April 2005, so the June 2016 download does not require updating.

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 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, ¹⁹ 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 A-101 headspace, only headspace measurements were appropriate. This required no scrutiny for the TWINS HS or SWIHD HS databases because they were headspace only for A Farm tanks, but the TWINS IH database required sorting so that only headspace data were used. Almost all A Farm data in the TWINS IH database were attributed to individual tank locations, although three rows had locations of "Inside Farm." Only data that listed A-101 as a location were used. All of these had Survey Titles that included phrases such as "Breather Filter Sampling," or "Headspace." Because the location was specified as A-101 and the Survey Title all referred to headspace or breather filter sampling, all of the TWINS IH A-101 data were considered to be from tank headspace.

Maximum and average⁽²⁰⁾ headspace concentrations were found for each analyte for the combined TWINS IH and SWIHD HS databases. 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 less representative of the vapors present during cartridge testing, and the default approach 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. When this was the case, results for the three-database combination

¹⁹ Hoppe, EW, LA Mahoney, J Cole, and KS Rohlfing. 2016. *Hanford Tank Vapors COPCs Update*. PNNL-25880, Pacific Northwest National Laboratory, Richland, Washington.

²⁰ Arithmetic average.

²¹ The A-101 data in the SWIHD HS database were for dates between July 17, 2015, and June 1, 2016.

²² This evaluation used the concentration data in SWIHD HS and converted them to %OEL, rather than directly using the %OEL data in SWIHD HS. Although this approach was consistent with the methods used on the other two data sets, there are cases where it gave a %OEL value smaller than that found in the SWIHD database. This difference occurs because concentrations in SWIHD HS may be truncated to one or two significant figures, while the %OEL values in SWIHD HS are calculated from concentrations before truncation. The difference between %OEL based on truncated and non-truncated concentrations is small enough to have no effect on conclusions about whether cartridge maxima are consistent with historical maxima.

²³ All % OEL values were calculated from concentration data that had been rounded to a minimum of three significant figures.

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 criterion for tabulating this extra information was difference of a factor of 3 or more, in either direction, between the value obtained from the two-database combination and that from the three-database combination.

Because the reporting limits on concentrations in the historical database were generally higher than the reporting limits or detection limits 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 A-101 Measurements

							Histo	Historical Measurements	ements ¹		N.	Measurements in this study	s in this stud	ły
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Maximum Value	Average Value	Maximum Value (%0EL)	Average Value (%0EL)	Max Inlet (%0EL)	Avg. Inlet (%OEL)	Max outlet (%0EL)	Approx. DL ¹³ (%OEL)
Inorganic	anic					İ								
1	Ammonia	7664-41-7	-28	Poling et al., 2007 ²	25 ppm	15	148 800	58.7*	592% 3200%	235%* 1028%	484%	401%	348%	2.55% (RL)
2	Nitrous Oxide	10024-97-2	-127	Poling et al., 2007	50 ppm	1 20	<rl 250</rl 	<rl 158</rl 	<rl 500%</rl 	<rl 316%</rl 		Not Measured	asured	
æ	Mercury	7439-97-6	674	Poling et al., 2007	0.025 mg/m³	15	0.011	0.00482	44%	19%	33.8%	31.7%	<rl< td=""><td>7.38% (RL)</td></rl<>	7.38% (RL)
Hydro	Hydrocarbons													
4	1,3-Butadiene	106-99-0	24	Poling et al., 2007	1 ppm	37	0.512	0.0287*	51%	2.9%*	<rl< td=""><td><rl< td=""><td>2.44%</td><td>2.44-2.64% (RL)</td></rl<></td></rl<>	<rl< td=""><td>2.44%</td><td>2.44-2.64% (RL)</td></rl<>	2.44%	2.44-2.64% (RL)
2	Benzene	71-43-2	176	Poling et al., 2007	0.5 ppm	37	0.0085	0.00452	1.7%	%6:0	0.13%	0.12%	%80.0	0.03%
9	Biphenyl	92-52-4	491	Poling et al., 2007	0.2 ppm	26	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>70></td><td>0.29%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>70></td><td>0.29%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>70></td><td>0.29%</td></rl<></td></rl<>	<rl< td=""><td>10></td><td>10></td><td>70></td><td>0.29%</td></rl<>	10>	10>	70>	0.29%
Alcohols	slo													
7	1-Butanol	71-36-3	243	NIOSH	20 ppm	23	0.044	0.0168	0.22%	0.08%	0.13%	0.12%	10>	0.004%
00	Methanol	67-56-1	148	Poling et al., 2007	200 ppm	9	0.43	0.251	0.22%	0.13%		Not Measured	asured	
Ketones	es													
6	2-Hexanone	591-78-6	262	NIOSH	5 ppm	37	<rl< td=""><td>0.00421*</td><td><rl< td=""><td>0.08%*</td><td>0.02%</td><td>TO></td><td>10></td><td>0.020%</td></rl<></td></rl<>	0.00421*	<rl< td=""><td>0.08%*</td><td>0.02%</td><td>TO></td><td>10></td><td>0.020%</td></rl<>	0.08%*	0.02%	TO>	10>	0.020%
10	3-Methyl-3-butene-2-one	814-78-8	208	CRC Handbook 1989 ⁴	0.02 ppm	0	n/a	n/a	n/a	n/a		Not detected - TIC ¹²	ed - TIC ¹²	
11	4-Methyl-2-hexanone	105-42-0	282	Predicted ACD/Labs ⁵	0.5 ppm	25	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>TQ></td><td>10></td><td>10></td><td>0.03%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>TQ></td><td>10></td><td>10></td><td>0.03%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>TQ></td><td>10></td><td>10></td><td>0.03%</td></rl<></td></rl<>	<rl< td=""><td>TQ></td><td>10></td><td>10></td><td>0.03%</td></rl<>	TQ>	1 0 >	10>	0.03%
12	6-Methyl-2-heptanone	928-68-7	333	Predicted ACD/Labs	8 ppm	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
13	3-Buten-2-one	78-94-4	179	CRC Handbook 1989	0.2 ppm	35	<rl< td=""><td>0.00509*</td><td><rl< td=""><td>2.5%*</td><td>0.38%</td><td>0.33%</td><td>0.64%</td><td>0.09%</td></rl<></td></rl<>	0.00509*	<rl< td=""><td>2.5%*</td><td>0.38%</td><td>0.33%</td><td>0.64%</td><td>0.09%</td></rl<>	2.5%*	0.38%	0.33%	0.64%	0.09%
Aldehydes	ydes													
14	Formaldehyde	20-00-0	-6	NIOSH	0.3 ppm	15	0.024	0.00726	8.0%	2.4%	5.2%	3.5%	2.1%	0.61% (RL)
15	Acetaldehyde	75-07-0	69	NIOSH	25 ppm	24	0.142	0.0308	0.57%	0.12%	0.22%	0.20%	0.13%	0.005% (RL)
16	Butanal	123-72-8	167	Oxford safety data ⁶	25 ppm	20	0.015	0.00542	0.06%	0.02%	0.008%	0.006%	0.002%	0.001%
17	2-Methyl-2-butenal	1115-11-3	244	United Nations ⁷	0.03 ppm	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
18	2-Ethyl-hex-2-enal	645-62-5	347	Predicted ACD/Labs	0.1 ppm	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	

 Table F.1. COPC Comparison to Historical A-101 Measurements (continued)

							Histor	Historical Measurements	ements 1		M	Measurements in this study	s in this stud	Ιγ
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%0EL)	Avg. Inlet (%0EL)	Max outlet (%0EL)	Approx. DL ¹³ (%OEL)
urans	St										1			
19	Furan	110-00-9	88	Poling et al., 2007	1 ppb	40	<rl< td=""><td>3.17</td><td><rl< td=""><td>317%</td><td>4.8%</td><td>3.7%</td><td>1.3%</td><td>0.87%</td></rl<></td></rl<>	3.17	<rl< td=""><td>317%</td><td>4.8%</td><td>3.7%</td><td>1.3%</td><td>0.87%</td></rl<>	317%	4.8%	3.7%	1.3%	0.87%
20	2,3-Dihydrofuran	1191-99-7	130	Alfa Aesar ⁸	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>4.2%</td><td>2.4%</td><td>2.6%</td><td>1.8%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>4.2%</td><td>2.4%</td><td>2.6%</td><td>1.8%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>4.2%</td><td>2.4%</td><td>2.6%</td><td>1.8%</td></rl<></td></rl<>	<rl< td=""><td>4.2%</td><td>2.4%</td><td>2.6%</td><td>1.8%</td></rl<>	4.2%	2.4%	2.6%	1.8%
21	2,5-Dihydrofuran	1708-29-8	152	Aldrich ⁹	1 ppb	40	≺RL	<rl< td=""><td><rl< td=""><td>≺RL</td><td>TQ></td><td>70></td><td>3.8%</td><td>2.2%</td></rl<></td></rl<>	<rl< td=""><td>≺RL</td><td>TQ></td><td>70></td><td>3.8%</td><td>2.2%</td></rl<>	≺RL	TQ>	70>	3.8%	2.2%
22	2-Methylfuran	534-22-5	147	Oxford safety data	1 ppb	39	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>TO></td><td>-DL</td><td>2.1%</td><td>1.9%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>TO></td><td>-DL</td><td>2.1%</td><td>1.9%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>TO></td><td>-DL</td><td>2.1%</td><td>1.9%</td></rl<></td></rl<>	<rl< td=""><td>TO></td><td>-DL</td><td>2.1%</td><td>1.9%</td></rl<>	TO>	-DL	2.1%	1.9%
23	2,5-Dimethylfuran	625-86-5	199	Alfa Aesar	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>70></td><td>7U></td><td>3.1%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>70></td><td>7U></td><td>3.1%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>10></td><td>70></td><td>7U></td><td>3.1%</td></rl<></td></rl<>	<rl< td=""><td>10></td><td>70></td><td>7U></td><td>3.1%</td></rl<>	10>	70>	7U>	3.1%
24	2-Ethyl-5-methylfuran	1703-52-2	246	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	e/u		Not detected - TIC ¹²	ed - TIC ¹²	
25	4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	328	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
26	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	306	Predicted ACD/Labs	1 ppb	0	n/a	n/a	e/u	n/a		Not Detected - TIC	ted - TIC	
27	2-Pentylfuran	3777-69-3	333	Alfa Aesar	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>2.0%</td><td>1.7%</td><td>2.7%</td><td>1.7%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>2.0%</td><td>1.7%</td><td>2.7%</td><td>1.7%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>2.0%</td><td>1.7%</td><td>2.7%</td><td>1.7%</td></rl<></td></rl<>	<rl< td=""><td>2.0%</td><td>1.7%</td><td>2.7%</td><td>1.7%</td></rl<>	2.0%	1.7%	2.7%	1.7%
28	2-Heptylfuran	3777-71-7	410	Alfa Aesar	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.6%</td><td>1.3%</td><td>1.8%</td><td>1.1%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>1.6%</td><td>1.3%</td><td>1.8%</td><td>1.1%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>1.6%</td><td>1.3%</td><td>1.8%</td><td>1.1%</td></rl<></td></rl<>	<rl< td=""><td>1.6%</td><td>1.3%</td><td>1.8%</td><td>1.1%</td></rl<>	1.6%	1.3%	1.8%	1.1%
29	2-Propylfuran	4229-91-8	231	Alfa Aesar	1 ppb	13	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>3.4%</td><td><dl< td=""><td>TO></td><td>2.8%</td></dl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>3.4%</td><td><dl< td=""><td>TO></td><td>2.8%</td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>3.4%</td><td><dl< td=""><td>TO></td><td>2.8%</td></dl<></td></rl<></td></rl<>	<rl< td=""><td>3.4%</td><td><dl< td=""><td>TO></td><td>2.8%</td></dl<></td></rl<>	3.4%	<dl< td=""><td>TO></td><td>2.8%</td></dl<>	TO>	2.8%
30	2-Octylfuran	4179-38-8	452	Predicted ACD/Labs	1 ppb	0	n/a	n/a	e/u	n/a	•	Not Detected - TIC	ted - TIC	
31	2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	909	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
32	2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not available	Not available	1 ppb	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
hthe	phthalates													
33	Diethylphthalate	84-66-2	563	NIOSH	5 mg/m³	26	≺RL	<rl< td=""><td><rl< td=""><td>≺RL</td><td>10></td><td>-OL</td><td>-DI</td><td>0.13%</td></rl<></td></rl<>	<rl< td=""><td>≺RL</td><td>10></td><td>-OL</td><td>-DI</td><td>0.13%</td></rl<>	≺RL	10>	-OL	-DI	0.13%

 Table F.1. COPC Comparison to Historical A-101 Measurements (continued)

							Histo	Historical Measurements ¹	ments 1		2	Measurements in this study	s in this stu	λį
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Maximum Value	Average Value	Maximum Value (%0EL)	Average Value (%OEL)	Max Inlet (%0EL)	Avg. Inlet (%0EL)	Max outlet (%0EL)	Approx. DL ¹³ (%OEL)
Nitriles	ies .													
34	Acetonitrile	75-05-8	179	NIOSH	20 ppm	35	5.16	0.879	792	4.4%	%69.0	0.46%	12.4%	0.001%
35	Propanenitrile	107-12-0	207	NIOSH	mdd 9	27	<rl< td=""><td>0.00393</td><td><rl< td=""><td>0.07%</td><td>0.07%</td><td>%90.0</td><td>0.04%</td><td>0.004%</td></rl<></td></rl<>	0.00393	<rl< td=""><td>0.07%</td><td>0.07%</td><td>%90.0</td><td>0.04%</td><td>0.004%</td></rl<>	0.07%	0.07%	%90.0	0.04%	0.004%
36	Butanenitrile	109-74-0	244	NIOSH	mdd 8	25	0.041	0.00824*	0.51%	0.10%*	0.04%	0.03%	10>	0.003%
37	Pentanenitrile	110-59-8	284	Alfa Aesar	mdd 9	27	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.015%</td><td>0.010%</td><td>0.006%</td><td>0.004%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.015%</td><td>0.010%</td><td>0.006%</td><td>0.004%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.015%</td><td>0.010%</td><td>0.006%</td><td>0.004%</td></rl<></td></rl<>	<rl< td=""><td>0.015%</td><td>0.010%</td><td>0.006%</td><td>0.004%</td></rl<>	0.015%	0.010%	0.006%	0.004%
38	Hexanenitrile	628-73-9	328	Predicted ACD/Labs	mdd 9	27	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>0.003%</td><td>0.003%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>0.003%</td><td>0.003%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>0.003%</td><td>0.003%</td></rl<></td></rl<>	<rl< td=""><td>10></td><td>10></td><td>0.003%</td><td>0.003%</td></rl<>	10>	10>	0.003%	0.003%
39	Heptanenitrile	629-08-3	368	Alfa Aesar	mdd 9	0	n/a	n/a	n/a	n/a		Not detected	ed - TIC ¹²	
40	2-Methylene butanenitrile	1647-11-6	Not available	Not available	0.3 ppm	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
41	2,4-Pentadienenitrile	1615-70-9	278	Predicted ACD/Labs	0.3 ppm	0	n/a	n/a	e/u	e/u		Not Detected - TIC	ted - TIC	
Amines	sa													
42	Ethylamine	75-04-7	62	Poling et al., 2007	2 ppm	17	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.34%</td><td>0.15%</td><td><rl< td=""><td>0.10% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.34%</td><td>0.15%</td><td><rl< td=""><td>0.10% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.34%</td><td>0.15%</td><td><rl< td=""><td>0.10% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td>0.34%</td><td>0.15%</td><td><rl< td=""><td>0.10% (RL)</td></rl<></td></rl<>	0.34%	0.15%	<rl< td=""><td>0.10% (RL)</td></rl<>	0.10% (RL)
Nitro	Nitrosamines													
43	N-Nitrosodimethylamine	65-72-9	306	NIOSH	0.3 ppb	15	1.25	0.372*	417%	124%*	224%	157%	<rl< td=""><td>8-12% (RL)</td></rl<>	8-12% (RL)
44	N-Nitrosodiethylamine	55-18-5	351	Oxford safety data	0.1 ppb	15	<rl< td=""><td>0.0725</td><td><rl< td=""><td>73%</td><td>74%</td><td>50%</td><td><rl< td=""><td>28.7% (RL)</td></rl<></td></rl<></td></rl<>	0.0725	<rl< td=""><td>73%</td><td>74%</td><td>50%</td><td><rl< td=""><td>28.7% (RL)</td></rl<></td></rl<>	73%	74%	50%	<rl< td=""><td>28.7% (RL)</td></rl<>	28.7% (RL)
45	N-Nitrosomethylethylamine	10595-95-6	310	Predicted ACD/Labs	0.3 ppb	15	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>11.1% (RL)</td></rl<></td></rl<>	<rl< td=""><td>11.1% (RL)</td></rl<>	11.1% (RL)
46	N-Nitrosomorpholine	59-89-2	435	Oxford safety data	0.6 ppb	15	0.143	0.0671*	24%	11%*	8.0%	5.5%	⟨RL	3.3% (RL)
Orga	Organophosphates													
47	Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	26	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<></td></dl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<></td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<></td></dl<></td></rl<></td></rl<>	<rl< td=""><td><dl< td=""><td><dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<></td></dl<></td></rl<>	<dl< td=""><td><dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<></td></dl<>	<dl< td=""><td><dl< td=""><td>0.23%</td></dl<></td></dl<>	<dl< td=""><td>0.23%</td></dl<>	0.23%
48	Dibutyl butylphosphonate	78-46-6	602	Predicted ACD/Labs	0.007 ppm	26	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>7O></td><td>4.5%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>7O></td><td>4.5%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>10></td><td>10></td><td>7O></td><td>4.5%</td></rl<></td></rl<>	<rl< td=""><td>10></td><td>10></td><td>7O></td><td>4.5%</td></rl<>	10>	10>	7O>	4.5%
Halog	Halogenated										•	•		
49	Chlorinated Biphenyls	Varies	Varies	Varies	1 mg/m³	0	n/a	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
20	2-Fluoropropene	1184-60-7	-111	SynQuest ¹¹	0.1 ppm	1	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<></td></rl<>	<rl< td=""><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<>		Not Detected - TIC	ted - TIC	
Pyridines	ines										-	-		
51	Pyridine	110-86-1	240	NIOSH	1 ppm	40	<rl< td=""><td>0.00518*</td><td><rl< td=""><td>0.52%*</td><td>0.16%</td><td>0.11%</td><td><rl< td=""><td>0.03% (RL)</td></rl<></td></rl<></td></rl<>	0.00518*	<rl< td=""><td>0.52%*</td><td>0.16%</td><td>0.11%</td><td><rl< td=""><td>0.03% (RL)</td></rl<></td></rl<>	0.52%*	0.16%	0.11%	<rl< td=""><td>0.03% (RL)</td></rl<>	0.03% (RL)
52	2,4-Dimethylpyridine	108-47-4	318	Alfa Aesar	0.5 ppm	39	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.06% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.06% (RL)</td></rl<>	0.06% (RL)

Table F.1. COPC Comparison to Historical A-101 Measurements (continued)

						Histo	Historical Measurements	ements ¹		Σ	Measurements in this study	s in this stud	٨
COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)		Number Maximum of Value	Average Value	Maximum Value (%0EL)	Average Value (%0EL)	Max Inlet (%OEL)	Avg. Inlet (%0EL)	Max outlet (%0EL)	Approx. DL ¹³ (%OEL)
nonitrites													
Methyl nitrite	624-91-9	10	Oxford safety data	0.1 ppm	3	n/a 0.43	n/a 0.318	n/a 430%	n/a 318%		Not detected - TIC ¹²	ed - TIC ¹²	
Butyl nitrite	544-16-1	172	Alfa Aesar	0.1 ppm	0	e/u	n/a	e/u	n/a		Not Detected - TIC	ted - TIC	
nonitrates													
Butyl nitrate	928-45-0	276	Predicted ACD/Labs	2.5 ppm	0	e/u	e/u	e/u	n/a		Not Detected - TIC	ted - TIC	
1,4-Butanediol, dinitrate	3457-91-8	499	Predicted ACD/Labs	0.05 ppm	0	e/u	n/a	e/u	n/a		Not Detected - TIC	ted - TIC	
2-Nitro-2-methylpropane	594-70-7	260	Alfa Aesar	0.3 ppm	0	e/u	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	338	Predicted ACD/Labs	0.05 ppm	0	e/u	n/a	n/a	n/a		Not Detected - TIC	ted - TIC	
anates													
Methyl Isocyanate	624-83-9	103	NIOSH	0.02 ppm	2	≺RL	<rl< td=""><td><rl< td=""><td>≺RL</td><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<></td></rl<>	<rl< td=""><td>≺RL</td><td></td><td>Not Detected - TIC</td><td>ted - TIC</td><td></td></rl<>	≺RL		Not Detected - TIC	ted - TIC	
orical data from TWINS industrial Hygiene wapor database and SWIH database; see text for links and dates of queries. Values in Italiss include those data plus data from the TWINS headspace database, all samples earlier	e vapor database	e and SWIH	database; see text for lii	nks and dates of a	ueries. Val	ues in italics i	include those	data plus datu	a from the TM	/INS headspa	ce database,	all samples	arlier

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than May 2005. Histori

^{*} 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 limit.

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. Poling, B. E.; Prausnitz, J. M.; 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, 1989.

ACD/Labs software http://www.acdlabs.com/products/percepta/predictors.php

[†] Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

^{&#}x27; Food and Agriculture Organization of the United Nations

Alfa Aesar: https://www.alfa.com/

Aldrich: https://www.sigmaaldrich.com/

¹⁰ OSHA: Occupational Safety and Health Administration

¹¹ SynQuest: http://synquestlabs.com/product/id/8330.html

¹³ Approximate Detection Limit (DL) is calculated using the reported detection limit (or reporting limit) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube. ¹² TIC: Tentatively Identified Compounds that were not observed in this study using the specified analytical methods.

F.2 A-101 Headspace: Comparison with Historical Data

The maximum and average COPC concentrations measured during cartridge testing were compared to the maximum and average historical concentrations, and where differences were found, historical data were examined for explanations in the type or circumstances of sampling.

Much of the waste in A-101 was transferred out during the May 2000–July 2003 period. Hence, all data predating July 2003 are considered inappropriate for comparison to the July 2016 cartridge test data. This includes all data from the TWINS HS database from which the latest A-101 data were taken in September 2002. Earlier data do not appear in Table C.1, although they do appear in the A-101 individual test report.

The headspaces of all six tanks in the A Tank Farm are connected by overflow cascade lines and a ventilation header (Huckaby et al. 2004). Therefore, waste disturbances in any A Farm tank could propagate changes in vapor concentration to the A-101 headspace. However, there have been no such waste disturbances in the post-2003 period. All post-2003 A-101 vapor data were taken under non-disturbance conditions.

The larger discrepancies, or apparent discrepancies, between cartridge inlet and historical concentrations are discussed in the following sections.

F.2.1 Ammonia

The maximum cartridge inlet concentration of 484% of the OEL is low compared to the historical maximum concentration in TWINS HS (i.e., 800 ppm [3200% of the OEL). However, this measurement was made in 1995 and is not pertinent to the waste that was present during cartridge testing in 2016. The maximum historical concentration measured in data sets other than TWINS HS was 148 ppm (592% of the OEL), measured on July 17, 2015 (SWIHD HS). The cartridge-testing inlet concentration is close to and consistent with the historical maximum for more current conditions.

F.2.2 Nitrous Oxide

Nitrous oxide was not measured during cartridge testing. A number of measurements were found in the TWINS HS database, but all were taken in 1998 or earlier and are not a good match for the waste presently in the tank. Only one recent measurement was found in TWINS IH. This was a below-report with an RL of $1.9~\rm ppm$ (<3.8% of the OEL), which was measured on July 28, 2005, at a breather filter.

F.2.3 1,3-Butadiene

The maximum cartridge inlet concentration was less than the RL (2.6% of the OEL) and <20% of the historical maximum of 0.512 ppm (51% of the OEL) measured on July 17, 2015 (SWIHD HS). There were no other post-2003 above-report data for the chemical; all other measurements were below the RL of 0.019 ppm (1.9% of the OEL). The cartridge inlet concentration is considered to be <20% of historical data 24 .

 $^{^{24}}$ This section uses the thresholds from Appendix C in Freeman et.al. [19]. Discrepancies are discussed if the maximum historical concentration of a compound was >10% of the OEL and the maximum cartridge inlet concentration was <50% of the historical value. However, discrepancies are considered significant only if the maximum historical concentration was >10% of the OEL and the maximum cartridge inlet concentration is <20% of the historical value.

F.2.4 Furan

The maximum cartridge inlet concentration of 45.5% of the OEL (measured by the Carbotrap 300 TDU method) is much lower than the historical maximum, a June 1, 2016, below-report with an RL of 7.06 ppb (<706% of the OEL) that was found in the SWIHD HS database. It was also lower than the only above-report concentration in SWIHD HS, 1.75 ppb (175% of the OEL), which was measured in the headspace on July 17, 2015. There were no above-report concentrations in the TWINS IH database, and the only measurement in the TWINS HS database was a below-report from a sample taken in 2002, before the waste transfer from A-101 was complete. The cartridge inlet maximum concentration is between 20% and 50% of the historical above-report maximum and therefore is not considered significantly lower.

F.2.5 2,5-Dihydrofuran, 2-Methylfuran

For both these chemicals, the cartridge inlet concentration was below the detection limit, 26% of the OEL for 2,5-dihydrofuran and 15% OEL for 2-methylfuran. The concentrations were less than the below-report historical maxima that came from RLs that were 686% and 586% of the OEL for 2,5-dihydrofuran and 2-methylfuran, respectively. The high RLs for 2,5-dihydrofuran and 2-methylfuran come from SWIHD HS and are not unusually high for Carbotrap 300 TDU analyses. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentrations lie with respect to historical data.

F.2.6 2,3-Dihydrofuran, 2,5-Dimethylfuran, 2-Pentylfuran, 2-Heptylfuran, 2-Pentylfuran

For all of these chemicals, the cartridge inlet concentration (or its DL, for less than DL cases) is 5% of the OEL or less. The concentrations were less than the below-report historical maxima that came from RLs that were 15 to 36% of the OEL. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentrations lie with respect to historical data.

F.2.7 Acetonitrile

The maximum cartridge inlet concentration of 0.69% of the OEL is less than the SWIHD HS historical maximum, 5.16 ppm (26% of the OEL) measured in 2015. There are a number of other historical measurements in SWIHD HS, all taken in 2015–2016, that are greater than $5\times$ the maximum cartridge inlet concentration. The cartridge inlet concentration is <20% of historical data.

F.2.8 N-Nitrosomorpholine

The maximum cartridge inlet concentration of 8% of the OEL was less than the historical maximum concentration of 0.143 ppb (24% of the OEL). This measurement was in SWIHD HS. It was the only above-report in the databases and was taken on May 24, 2016. The maximum cartridge inlet concentration was <50% but >20% of the single above-report historical concentration, and therefore was not substantially lower than available historical data.

F.2.9 Dibutyl Butylphosphonate (DBBP)

The maximum cartridge inlet concentration of <4.5% of the OEL, which is below its DL, is low compared to the historical maximum concentration, a below-report datum with an RL of 0.002 ppm (<29% of the OEL). This was not an unusually high RL value in the 2015–2016 SWIHD HS database. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentration lies with respect to historical data.

F.2.10 Methyl Nitrite

The cartridge inlet concentration was a non-detect—a Tentatively Identified Compound—while the historical maximum concentration was 0.43 ppm (430% of the OEL). Historical data were present only in the TWINS HS database, three measurements taken in 1995. Those measurements are not applicable because they were taken before waste removal during 2000–2003. There were no above-report historical data after 2003, so no conclusion can be drawn about where the cartridge inlet concentration lies with respect to historical data.

F.2.11 Methyl Isocyanate

This chemical was a Tentatively Identified Compound at the inlet in cartridge testing. There were only two historical concentrations, both below-report. The maximum had an RL of 0.00702 ppm (<35% of the OEL). Given the scarcity of data, no conclusion can be drawn about where the cartridge inlet concentration for this chemical lies with respect to historical data.

F.2.12 Summary of Historical Data for the A-101 Headspace

In summary, cartridge inlet concentrations for the A-101 headspace that were substantially lower than historical data can be described as follows:

- Differences arose from using historical data taken during disturbance for the historical maximum: none.
- Differences arose from using the RLs of below-report data for the historical maximum: none.
- Differences arose from using data for vapor produced by a no-longer-existing inventory for the historical maximum: ammonia.
- Differences could not be resolved because of the scarcity of non-disturbance above-report data: 2,3-dihydrofuran, 2,5-dihydrofuran, 2-methylfuran, 2,5-dimethylfuran, 2-heptylfuran, 2-pentylfuran, 2-propylfuran, dibutyl butylphosphonate, methyl nitrite, methyl isocyanate.
- Cartridge inlet concentrations were determined to be significantly lower than above-report historical concentrations: 1,3-butadiene, acetonitrile.



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