ANNUAL GROUNDWATER MONITORING REPORT

(INCLUDES FOURTH QUARTER 2015 SEMIANNUAL GROUNDWATER MONITORING REPORT)

Hazardous Waste Management Units
5 and 16
CALENDAR YEAR 2015

RADFORD ARMY AMMUNITION PLANT (RFAAP)
RADFORD, VIRGINIA

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This report is presented in a fully electronic version and as a bound hard copy version.

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EXECUTIVE SUMMARY

This document presents the Annual Groundwater Monitoring Report for calendar year 2015 for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (original effective date October 4, 2002; reissued August 16, 2014). This Annual Groundwater Monitoring Report evaluates the analytical data from Second Quarter 2015 and Fourth Quarter 2015 for each Unit.

HWMU-5

HWMU-5 has been in corrective action (CA) since 2010. Semiannual CA groundwater monitoring events for HWMU-5 were conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*. Semiannual monitoring is conducted during the second and fourth quarter of each year.

During Second and Fourth Quarter 2015, trichloroethene (TCE) was detected in point of compliance wells 5WC21, 5WC22, and 5WC23 at concentrations less than the GPS of 5 µg/l. TCE was not detected at concentrations greater than the QL in any other wells comprising the CA monitoring network during the calendar year 2015 monitoring events.

Total cobalt was detected at concentrations greater than the GPS of 7 µg/l in point of compliance wells 5WC21, 5WC22, and 5WC23 during Second and Fourth Quarters 2015. Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network.

Overall, evaluation of calendar year 2015 data for the CA Targeted Constituents and comparison with historical data indicates effective progress of groundwater CA through natural attenuation. TCE remedial endpoints have been achieved. No changes to the continuation of the groundwater CA program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-5. The next monitoring event is scheduled for Second Quarter 2016.

HWMU-16

Semiannual Compliance groundwater monitoring for HWMU-16 is conducted during the second and fourth quarter of each year. Total cobalt was detected at a concentration greater than the GPS of 5 µg/l in point of compliance (POC) well 16WC1B during Second Quarter 2015 and Fourth Quarter 2015, and in POC well 16WC1A during Fourth Quarter 2015.

In early 2016, VDEQ concurred with RFAAP to combine the on-going Alternative Source Demonstration (ASD) for total cobalt at POC well 16WC1B with POC well 16WC1A. As part of the ASD, both wells are scheduled to be monitored semiannually for total cobalt through 2016.

Evaluation of the plume monitoring well data indicated that the concentrations of total barium in upgradient well 16C1 and in plume monitoring wells 16-2, 16-3, 16-5 and in spring sampling location 16SPRING were greater than the site-specific background concentration. Higher total barium concentrations in downgradient plume monitoring wells relative to background are likely due to natural variations in trace element distribution in groundwater. Upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Similar barium concentrations were observed in the POC wells. Therefore, no further action regarding the 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3, and 16-5 and in spring sampling location 16SPRING is recommended at this time.

It should be noted that as stated in Permit Condition I.K.2, the Compliance Period during which the GPS applies to HWMU-16 is 13 years, beginning on the effective date of the Permit and continuing until October 4, 2015, or until the Director approves clean closure of the unit. No changes to the continuation of the groundwater program are anticipated at this time. Semiannual groundwater monitoring will continue at HWMU-16. The next monitoring event is scheduled for Second Quarter 2016.

1.0 INTRODUCTION

This document presents the Annual Groundwater Monitoring Report for calendar year 2015 for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (Permit; original effective date October 4, 2002; reissued August 16, 2014).

The Annual Groundwater Monitoring Report presents the following set of information for each Unit: basic information and unit identification, a description of the groundwater monitoring plan, a discussion of groundwater movement, potentiometric surface maps, a table of groundwater elevations, and evaluations of the analytical data.

Please note that the Groundwater Protection Standards (GPS) for HWMUs 5 and 16 were revised in the VDEQ-approved Class 3 Permit Modification dated August 16, 2014 when the Permit was reissued. Therefore, the groundwater samples collected at HWMUs 5 and 16 during the Second and Fourth Quarters 2015 semiannual monitoring event were evaluated in accordance with the with the reissued Permit dated August 16, 2014.

1.1 HWMU-5

HWMU-5 is a closed lined neutralization pond. The Unit received certification for closure in 1989. As stated in Permit Condition I.K.1 of the Permit, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-5 is 19 years, beginning on the effective date of the original Post-Closure Care Permit for HWMU-5 (October 28, 2001) and continuing until October 28, 2020. The Second Quarter 2010 groundwater monitoring event served as the first semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with Permit Module VI – Groundwater Corrective Action & Monitoring Program for Unit 5.

1.2 HWMU-16

HWMU-16 is a closed hazardous waste landfill. The Unit received certification for closure in 1993. As stated in Permit Condition I.K.2, the Compliance Period during which the Groundwater Protection Standard applies to HWMU-16 is 13 years, beginning on the effective date of the Permit and continuing until October 4, 2015, or until the Director approves clean closure of the unit.

2.0 HWMU-5 ANNUAL GROUNDWATER MONITORING REPORT

2.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 5 (HWMU-5)
Owner/Operator: United States Army/BAE Systems, Ordnance Systems Inc.

Unit Location: RFAAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit
Type: Closed Lined Neutralization Pond

2.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well:	5W8B
Point of Compliance Wells:	5W5B, 5W7B, 5WC21, 5WC22, 5WC23
Plume Monitoring Wells:	5W12A
Observation Wells:	S5W5, S5W7, 5W9A, 5W10A, 5W11A, 5WCA, S5W6, S5W8, 5WC11, 5WC22

Monitoring Status: Corrective Action Monitoring Program

CY 2015 Monitoring Events:

Second Quarter 2015:	April 20-21, 2015
Fourth Quarter 2015:	October 19-20, 2015

HWMU-5 has been in corrective action (CA) since 2010. The calendar year 2015 groundwater monitoring events were conducted in accordance with Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5*. Semiannual monitoring is conducted during the second and fourth quarter of each year.

2.3 Groundwater Movement

The monitoring wells at HWMU-5 are screened entirely within either weathered carbonate bedrock residuum or alluvium or across the weathered residuum/carbonate bedrock interface. The static water level measurements gathered during the 2015 semiannual monitoring events are summarized in **Table 1**. Groundwater fluctuations ranged from 0.94 to 4.15 feet during the 2015 groundwater monitoring events. As shown on the HWMU-5 Potentiometric Surface Maps (**Appendix A-1**), groundwater movement beneath the site is generally to the northeast.

Darcian flow conditions were assumed for the alluvium, residuum, and carbonate bedrock beneath HWMU-5. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over

the potentiometric surface map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2015 groundwater elevations was calculated to be 0.023 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 5.25×10^{-5} ft/second. This value is consistent with literature values for carbonate rock and for clayey, silty sand and gravel alluvium and residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 0.26 ft/day or 95 ft/year based on the following:

- Average hydraulic conductivity of 5.25×10^{-5} ft/second.
- Average hydraulic gradient of 0.023 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock, weathered residuum, and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

2.4 Groundwater Analytical Data Evaluation

For Second Quarter 2015 and Fourth Quarter 2015, all of the wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The Second Quarter 2015 event also served as the annual monitoring event in which the point of compliance wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List).

The laboratory analytical results for the 2015 monitoring events are summarized in **Appendix A-2** (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List) and in **Appendix A-3** (Groundwater Corrective Action Annual Monitoring List). The laboratory analytical results for the 2015 monitoring events are included in **Appendix C**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix C**. Copies of field notes recorded during sample collection are included in **Appendix D**.

2.4.1 Semiannual Monitoring for Corrective Action Targeted Constituents

During the Second Quarter 2015 and Fourth Quarter 2015 monitoring events, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents listed in Appendix J to Permit Attachment 2. The CA Targeted Constituents consist of TCE and its daughter products: 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). In addition, the VDEQ added total cobalt to the list of CA Targeted Constituents during a meeting with RFAAP on May 4, 2011. The laboratory analytical results for the CA Targeted Constituents are summarized in **Appendix A-2**.

During Second Quarter 2015, TCE was detected in TCE was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 3.2 µg/l, 3.5 µg/l, and 4.6 µg/l, respectively, which are less than the GPS of 5 µg/l (**Appendix A-2**). TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

During Fourth Quarter 2015, TCE was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 2.9 µg/l, 3.3 µg/l, and 4.4 µg/l, respectively, which are less than the GPS of 5 µg/l (**Appendix A-2**). TCE was not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.

During Second Quarter 2015, total cobalt was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 64.9 µg/l, 17 µg/l, and 11.1 µg/l, respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l (**Appendix A-2**). Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network during Second Quarter 2015.

During Fourth Quarter 2015, total cobalt was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 75.2 µg/l, 23.9 µg/l, and 7.08 µg/l, respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l (**Appendix A-2**). Total cobalt was not detected at concentrations greater than the GPS in the other wells comprising the CA monitoring network during Fourth Quarter 2015.

2.4.2 Annual Monitoring List - Comparison to Groundwater Protection Standards

During Second Quarter 2015, groundwater samples collected from the point of compliance wells for HWMU-5 were analyzed for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List). Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous constituents that are not the targets for the current Corrective Action (e.g., TCE and its daughter products, total cobalt) are present at concentrations greater than the Groundwater Protection Standards (GPS) for the Unit. No additional hazardous constituents that are not targets for the

current Corrective Action for the Unit were detected at concentrations greater than their respective GPS during Second Quarter 2015 (**Appendix A-3**).

2.4.3 2015 USEPA Region 3 Regional Screening Levels (RSLs)

The USEPA periodically updates the Region 3 RSLs (formerly known as RBCs). As stated in section VI.E.3 of Module IV of the Permit, "The Permittee shall use the most up-to-date USEPA MCL, the Department ACL, or EPA Region 3 RBC as the GPS. If USEPA implements any changes to MCLs or RBCs, the GPS defined by that MCL or RBC will be updated to reflect the most current value established by USEPA."

At the time of the Second Quarter 2015 groundwater monitoring event, the January 2015 USEPA Region 3 RSL table reflected the most current value. The USEPA RSL for one constituent, diethyl ether, listed in Appendix K to Attachment 2 was updated from 7,300 µg/l to 3,900 µg/l; therefore, the GPS comparison value for diethyl ether listed in Appendix A-3 of this report is 3,900 µg/l. Diethyl ether is the only constituent listed in Appendix K to Attachment 2 whose GPS is based on an EPA RSL that was updated in 2015.

Diethyl ether was detected below the quantitation limit (12 µg/l) at estimated values of 1.4 µg/l and 4.5µg/l at wells 5WC21 and 5WC22, respectively, which are below the GPS listed Appendix K to Attachment 2 of the permit and the January 2015 USEPA Region 3 RSL of 3,900 µg/l. Diethyl ether was not detected in any other wells comprising the CA groundwater monitoring network.

2.4.4 Annual Monitoring List – Verification of Estimated Values

A footnote presented in Appendix K to Permit Attachment 2 indicates that verification is required for constituents detected at concentrations less than the QL if their associated GPSs are 1) based on background values equal to the QL, and 2) are greater than the applicable risk-based concentrations (i.e., ACL or RSL). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections if the QL achievable by that method is less than, or equal to, the ACL or RSL for the subject constituent. If a concentration greater than the low-level analytical method QL is observed, then the GPS for that constituent will be updated, if warranted. During Second Quarter 2015, no constituents with GPSs based on background values equal to their respective QLs and greater than the applicable risk-based concentrations were detected at concentrations less than their respective QLs; therefore, no further action was warranted.

2.5 Annual Evaluation of Effectiveness of Corrective Action

In accordance with Sections VI.B.6, VI.J.4.f and VI.J.4.g and other applicable sections of the Permit, RFAAP is required to perform an annual evaluation of the effectiveness of the Corrective Action Program (CAP) (monitored natural attenuation [MNA] program) for calendar year 2015. MNA is the current remedial measure implemented at the Unit to address TCE in groundwater at concentrations greater than the GPS.

During Second Quarter 2015 and Fourth Quarter 2015, TCE was detected in point of compliance wells 5WC21, 5WC22, and 5WC23 at concentrations less than the GPS of 5 µg/l. TCE was not detected at concentrations greater than the QL in any other wells comprising the CA monitoring network during the calendar year 2015 monitoring events. In accordance with the Permit, calculation of the predicted MNA remedial timeframe is not applicable since TCE data remained below the GPS in 2015.

2.6 Recommendations

Concentrations of TCE at HWMU-5 remained below the GPS throughout 2015 indicating remedial endpoints have been achieved. The current monitoring program should continue until the concentrations of TCE have remained below the GPS for a period of three consecutive years; upon which the Permittee will request to end corrective action and return to compliance monitoring which is currently scheduled to end October 28, 2020.

3.0 HWMU-16 ANNUAL GROUNDWATER MONITORING REPORT

3.1 Waste Management Unit Information

Unit Name: Hazardous Waste Management Unit 16 (HWMU-16)
Owner/Operator: United States Army/BAE Systems, Ordnance Systems Inc.

Unit Location: RFAAP Main Plant Area, Radford, Virginia

Class: Hazardous Waste Management Unit
Type: Closed Hazardous Waste Landfill

3.2 Groundwater Monitoring Plan

Monitoring Network:

Upgradient Well:	16C1
Point of Compliance Wells:	16WC1A, 16WC1B, 16MW8, 16MW9
Plume Monitoring Wells:	16-2, 16-3, 16-5, 16WC2B, 16SPRING
Observation Wells:	16-116WC2A, 16C3, 16CDH3

Monitoring Status: Compliance Monitoring Program

CY 2015 Monitoring Events:

Second Quarter 2015:	April 21-22, 2015
Fourth Quarter 2015:	October 13-14, 2015

The Compliance Monitoring Constituent List and GPS for HWMU-16 were revised in the August 16, 2014 reissuance of the Permit. Therefore, all groundwater samples collected at HWMU-16 during 2015 were evaluated in accordance with the August 16, 2014 VDEQ-approved Class 3 Permit Modification.

3.3 Groundwater Movement

The monitoring wells at HWMU-16 are screened entirely within either carbonate bedrock or weathered carbonate bedrock residuum, or across the residuum/bedrock interface. The static water level measurements gathered during the 2015 semiannual monitoring events are summarized in **Table 2**. Groundwater fluctuations ranged from 0.03 to 3.61 feet annually. As shown on the HWMU-16 Potentiometric Surface Maps (**Appendix B-1**), groundwater movement beneath the site is generally to the northeast.

Darcian flow conditions were assumed for the weathered residuum and carbonate bedrock beneath HWMU-16. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the potentiometric surface map, measuring their lengths, calculating the head

differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2015 groundwater elevations was calculated to be 0.083 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 7.87×10^{-5} ft/second. This value is consistent with literature values for carbonate rock and for clay and silt residuum (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 1.41 ft/day or 515 ft/year based on the following:

- Average hydraulic conductivity of 7.87×10^{-5} ft/second.
- Average hydraulic gradient of 0.083 ft/ft.
- Assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock and clay and silt residuum (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the velocity presented above depending on water level conditions and the distribution of solution features.

3.4 Groundwater Analytical Data Evaluation

The groundwater samples collected from the compliance monitoring network during the 2015 semiannual monitoring events were analyzed for the constituents listed in Appendix E to Attachment 3 in the August 16, 2014 reissuance of the Permit. In addition, groundwater samples were collected from the upgradient well and the point of compliance wells for the annual monitoring for the constituents listed in Permit Attachment 1, Appendix I. The laboratory analytical results for the 2015 monitoring events are included in **Appendix B-2** (point of compliance wells) and in **Appendix B-3** (plume monitoring wells). The laboratory analytical results for the 2015 monitoring events also are included in **Appendix C**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix C**. Copies of field notes recorded during sample collection are included on in **Appendix D**.

3.4.1 Comparison to Groundwater Protection Standards

As specified in the Permit, the 2015 groundwater analytical data for the upgradient well and the point of compliance wells were compared to GPS for HWMU-16 listed in Appendix G of Permit Attachment 3 in the August 16, 2014 reissuance of the Permit. In accordance with Permit Condition V.I.2, RFAAP performed a simple empirical comparison of the upgradient well and the point of compliance well data to the GPS (**Appendix B-2**).

During Second Quarter 2015 and Fourth Quarter 2015, total cobalt was detected in point of compliance well 16WC1B at concentrations of 22.3 µg/l and 17 µg/l, respectively, which are greater than the GPS of 5 µg/l. During Fourth Quarter 2015, total cobalt was detected in point of compliance well 16WC1A at a concentration of 5.38µg/l. Upon receipt of the Fourth Quarter 2015 analytical data, RFAAP notified the VDEQ of the initial detection of total cobalt at a concentration greater than the GPS of 5 µg/l in point of compliance well 16WC1A. On December 4, 2015 a verification sample was collected from well 16WC1A to confirm or refute this initial detection. Total cobalt was detected at a concentration greater than the GPS in the verification sample collected from point of compliance well 16WC1A.

In accordance with the Permit and as directed in VDEQ correspondence dated January 21, 2014, RFAAP began an ASD to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. The ASD consisted of four (4) independent samples from point of compliance well 16WC1B collected at a frequency of one sample per calendar quarter (First Quarter 2014 through Fourth Quarter 2014) to evaluate the effect of seasonal variation upon the total cobalt concentrations in groundwater. Additionally, the ASD evaluated additional monitoring wells in the Horseshoe Area of the Facility (the area containing HWMU-16) for natural variability of total cobalt within the aquifer. RFAAP submitted the ASD to the VDEQ on February 15, 2015.

As directed in a letter from the Department dated May 1, 2015, RFAAP continued to monitor cobalt concentrations in monitoring well 16WC1B. During sampling conducted in the Fourth Quarter of 2015 at HWMU-16, total cobalt was detected in POC monitoring wells 16WC1B and 16WC1A at concentrations greater than the GPS of 5 µg/L. A verification event conducted at 16WC1A in December 2015 confirmed total cobalt was detected above the GPS.

RFAAP had previously submitted the ASD to the Department indicating that the detections of cobalt in 16WC1B were due to natural variation. The Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. Subsequent to the additional detection and verification of cobalt in POC well 16WC1A, RFAAP requested in a letter dated December 14, 2015 that the ASDs for monitoring wells 16WC1A and 16WC1B be combined and monitoring for a minimum of one additional year prior to making a decision on the ASD.

In a letter dated January 5, 2016, VDEQ concurred with RFAAP to combine the ASDs and agreed to the one-year extension request as proposed. In a letter dated January 13, 2016, RFAAP proposed a sampling schedule for cobalt monitoring in POC monitoring wells 16WC1B and 16WC1A. VDEQ concurred with the proposed sampling and reporting schedule for the cobalt

ASD at HWMU-16 in an e-mail dated February 4, 2016. Copies of correspondence relating to groundwater monitoring activities conducted at HWMU-16 during calendar year 2015 are included in **Appendix E**.

A footnote presented in Appendix G of Permit Attachment 3 of the August 16, 2014 reissuance of the Permit indicates that verification is required for constituents detected at concentrations less than the QL if their associated GPSs are equal to the QL and are greater than the applicable risk-based concentrations (i.e., ACL or RSL). In these instances, verification must be conducted using an alternate low-level analytical method in order to confirm or refute the observed initial detections if the QL achievable by that method is less than, or equal to, the ACL or RSL for the subject constituent. If a concentration greater than the low-level analytical method QL is observed, then the GPS for that constituent will be updated, if warranted. During Fourth Quarter 2015, no constituents with GPSs equal to their respective QLs and greater than the applicable risk-based concentrations were detected at concentrations less than their respective QLs; therefore, no further action was warranted.

3.4.3 Comparison to Background Concentrations

As specified in Permit Condition V.O, the 2015 groundwater analytical data for the plume monitoring wells were compared to the background concentrations for HWMU-16 listed in Appendix F of Permit Attachment 3. In accordance with Permit Condition V.I.2, RFAAP performed a simple empirical comparison of the plume monitoring well data to the background concentrations (**Appendix B-3**).

As shown in **Appendix B-3**, total barium concentrations detected in plume monitoring wells 16-2 and 16-3 and in spring sampling location 16SPRING during both 2015 semiannual monitoring events and well16-5 during Fourth Quarter 2015 were greater than the background concentration of 175.4 µg/l. All of the total barium concentrations detected in the plume monitoring wells were well below the USEPA MCL for barium of 2,000 µg/l. Higher barium concentrations in downgradient plume monitoring wells relative to background may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 5), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain different trace element distributions.

No other constituent concentrations detected in the plume monitoring wells were greater than their respective background concentrations. In accordance with the requirements of Permit Condition V.K.3, the established background values and the computations used to determine the background values are included in **Appendix B-4**.

3.5 Recommendations

As part of the on-going ASD, total cobalt will be monitored at POC wells 16WC1B and 16WC1A on a semiannual basis for a minimum of one year. Per VDEQ's request, the combined

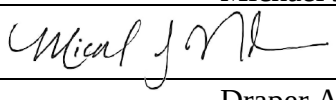
ASD report for 16WC1B and 16WC1Awill be submitted within 90 days from the Fourth Quarter 2016 semiannual groundwater monitoring event.

No further action regarding the 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3, 16-5 and in spring sampling location 16SPRING is recommended at this time.

SIGNATURE/CERTIFICATION

Prepared by:

Name: Michael J. Nelson, Senior Project Engineer

Signature: 

Company: Draper Aden Associates

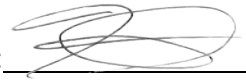
Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

Virginia Professional Certification:

I certify that I have prepared or supervised preparation of the attached report, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of my knowledge.

Name: Michael D. Lawless, Environmental Program Manager

Signature: 

Virginia Professional Certification Type and Number: PG 832

Company: Draper Aden Associates

Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

TABLES

TABLE 1
HWMU-5
GROUNDWATER ELEVATIONS - 2015
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

MONITORING WELL ID	ELEVATION TOP OF WELL	APRIL 20, 2015		OCTOBER 19, 2015	
		DTW	GW ELEV	DTW	GW ELEV
5W8B	1789.58	13.36	1776.22	14.99	1774.59
5W5B	1775.13	6.73	1768.40	9.14	1765.99
5W7B	1774.78	7.69	1767.09	9.20	1765.58
5WC21	1774.43	7.04	1767.39	9.31	1765.12
5WC22	1774.45	6.98	1767.47	9.27	1765.18
5WC23	1773.84	6.35	1767.49	8.66	1765.18
5W12A	1772.46	9.47	1762.99	11.96	1760.50
S5W5	1772.31	5.89	1766.42	8.28	1764.03
S5W7	1776.08	10.40	1765.68	12.10	1763.98
5W9A	1762.20	0.90	1761.30	2.01	1760.19
5W10A	1771.40	12.97	1758.43	13.91	1757.49
5W11A	1766.20	7.12	1759.08	11.27	1754.93
5WC11	1788.92	14.26	1774.66	16.01	1772.91
5WC12	1788.96	14.66	1774.30	16.37	1772.59
5WCA	1779.05	11.49	1767.56	12.88	1766.17
S5W6	1771.43	4.33	1767.10	7.04	1764.39
S5W8	1783.68	10.87	1772.81	12.02	1771.66

NOTES:
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.

TABLE 2
HWMU-16
GROUNDWATER ELEVATIONS - 2015
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

MONITORING WELL ID	ELEVATION TOP OF WELL	APRIL 21, 2015		OCTOBER 13, 2015	
		DTW	GW ELEV	DTW	GW ELEV
16C1	1840.14	48.28	1791.86	49.54	1790.60
16MW8	1815.82	71.19	1744.63	72.42	1743.40
16MW9	1808.88	61.64	1747.24	63.82	1745.06
16WC1A	1812.61	64.04	1748.57	66.19	1746.42
16WC1B	1812.95	63.98	1748.97	66.28	1746.67
16-1	1815.82	48.53	1767.29	47.09	1768.73
16-2	1810.99	55.88	1755.11	55.91	1755.08
16-3	1824.77	56.30	1768.47	56.54	1768.23
16-5	1742.60	3.65	1738.95	4.06	1738.54
16WC2B	1818.71	52.21	1766.50	53.16	1765.55
16WC2A	1820.05	DRY	DRY	DRY	DRY
16C3	1822.22	63.70	1758.52	67.31	1754.91
16CDH3	1825.60	DRY	DRY	DRY	DRY
SPRING	na	na	na	na	na

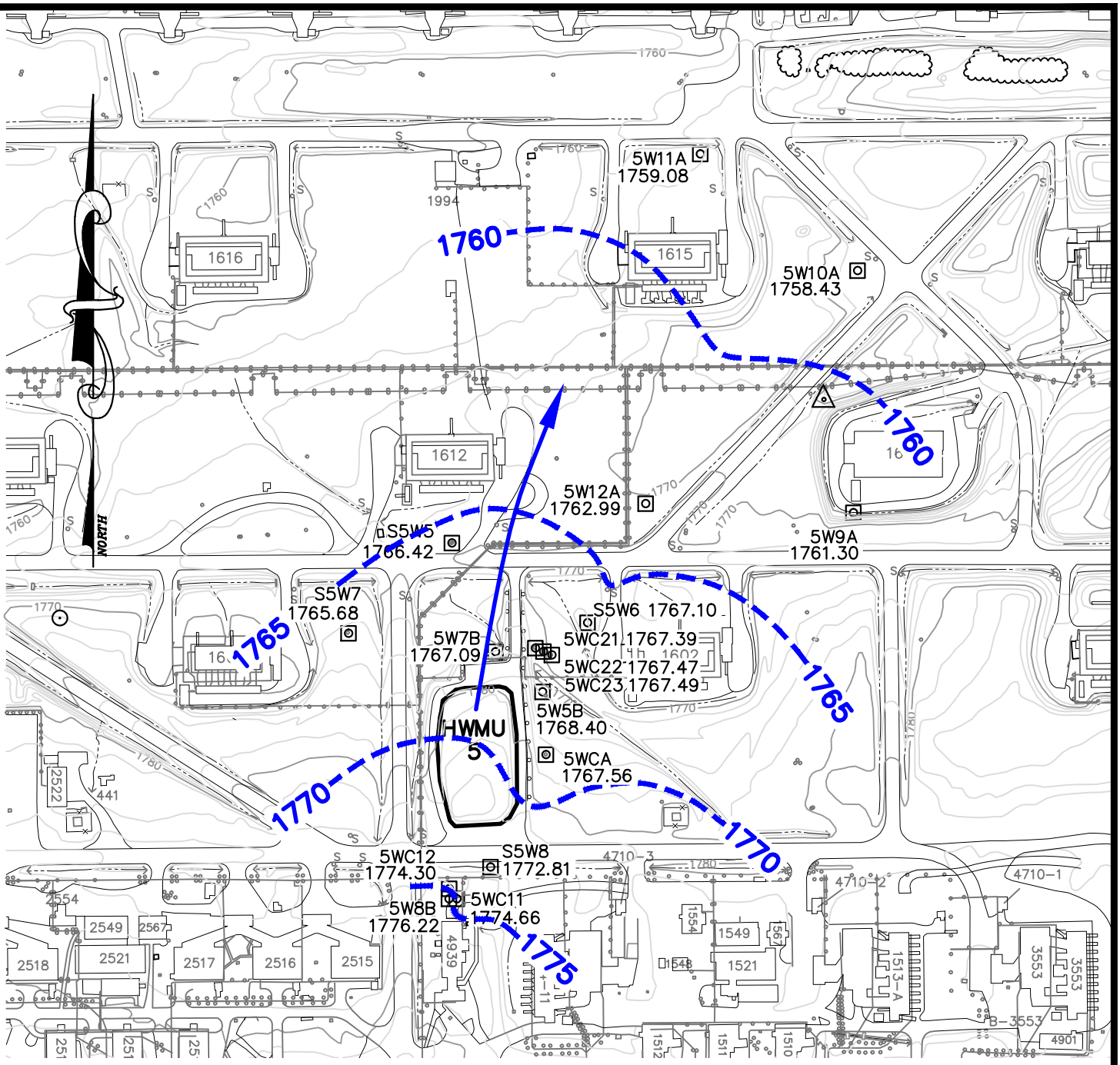
NOTES:
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.
na: Not applicable.

APPENDIX A

HWMU-5

APPENDIX A-1

HWMU-5 POTENTIOMETRIC SURFACE MAPS
SECOND QUARTER 2015
FOURTH QUARTER 2015



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)

1 inch = 200 ft.

LEGEND

5W7B 1767.09 — MONITORING WELL GROUNDWATER ELEVATION (feet above mean sea level)

--1770-- GROUNDWATER CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

HWMU-5 POTENTIOMETRIC SURFACE MAP (APRIL 20, 2015)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-13

Draper Aden Associates

Engineering • Surveying • Environmental Services

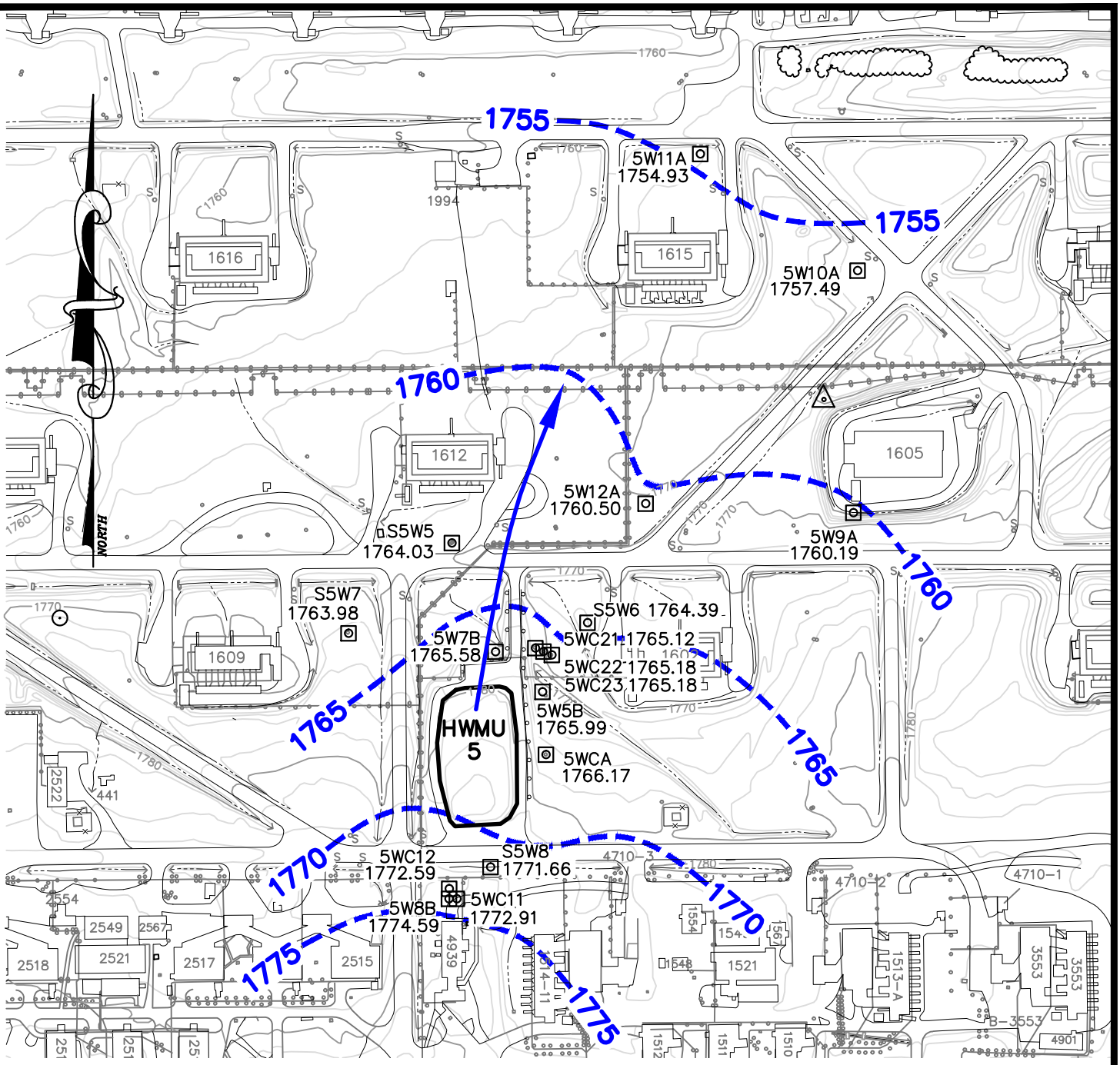
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291

Richmond, VA
Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED	SN
DRAWN	DLD
CHECKED	MDL
DATE	06/29/15

FIGURE 1

P:\B03200\B03204\B03204-13\CAD\B03204-13_HWMU-5 APR 2015.dwg Jul 20, 2015 1:39pm



GRAPHIC SCALE

200 0 100 200 400

(IN FEET)

1 inch = 200 ft.

LEGEND

5W7B ⊡ 1765.58 — MONITORING WELL GROUNDWATER ELEVATION (feet above mean sea level)

--1770-- GROUNDWATER CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

HWMU-5 POTENTIOMETRIC SURFACE MAP (OCTOBER 19, 2015)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-13A

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Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED	WMD
DRAWN	DLD
CHECKED	MDL
DATE	12/01/15

FIGURE 1

P:\B03\200\B03204\B03204-13\CAD\B03204-13_HWMU-5 OCT 2015.dwg Jan 26, 2016 9:58am

APPENDIX A-2

HWMU-5 2015 LABORATORY ANALYTICAL RESULTS
GROUNDWATER CORRECTIVE ACTION TARGETED CONSTITUENTS
GPS AND SEMIANNUAL MONITORING LIST

Summary of Semiannual Target Analyte Monitoring Results Appendix J
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	5W8B Q	5W5B Q	5W7B Q	5WC21 Q	5WC22 Q	5WC23 Q	5W12A Q	QL	Permit QL	GPS	DL	Permit DL	UNIT	Method
Cobalt						CAS # 7440-48-4								
Second Quarter 2015	U	U	2.34 J	64.9	17	11.1	U	5	5	7	1	1	ug/l	6020A
Fourth Quarter 2015	U	U	2.25 J	75.2	23.9	7.08	U	5	5	7	1	1	ug/l	6020A
1,1-Dichloroethene						CAS # 75-35-4								
Second Quarter 2015	U	U	U	U	U	U	U	1	1	7	0.4	0.44	ug/l	8260C
Fourth Quarter 2015	U	U	U	U	U	U	U	1	1	7	0.4	0.44	ug/l	8260C
cis-1,2-Dichloroethene						CAS # 156-59-2								
Second Quarter 2015	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/l	8260C
Fourth Quarter 2015	U	U	U	U	U	U	U	1	1	70	0.1	0.1	ug/l	8260C
trans-1,2-Dichloroethene						CAS # 156-60-5								
Second Quarter 2015	U	U	U	U	U	U	U	1	1	100	0.8	0.8	ug/l	8260C
Fourth Quarter 2015	U	U	U	U	U	U	U	1	1	100	0.8	0.8	ug/l	8260C
Trichloroethene						CAS # 79-01-6								
Second Quarter 2015	U	U	U	3.2	3.5	4.6	U	1	1	5	0.2	0.177	ug/l	8260C
Fourth Quarter 2015	U	U	U	2.9	3.3	4.4	U	1	1	5	0.2	0.177	ug/l	8260C
Vinyl chloride						CAS # 75-01-4								
Second Quarter 2015	U	U	U	U	U	U	U	1	1	2	0.1	0.1	ug/l	8260C
Fourth Quarter 2015	U J	U J	U J	U J	U J	U J	U J	1	1	2	0.1	0.1	ug/l	8260C

See last page of this report for definitions.

Summary of Semiannual Target Analyte Monitoring Results Appendix J
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*5W12A Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*

Definitions:

Results are reported to the permit detection limit.

QL Denotes laboratory quantitation limit.
Permit QL Denotes permit quantitation limit.
DL Denotes laboratory detection limit.
Permit DL Denotes permit detection limit.
U denotes not detected at or above the permit detection limit or QL.
UA denotes not detected at or above the adjusted detection limit or adjusted QL.
J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.
R Denotes result rejected.
Q Denotes data validation qualifier. **X** Denotes mass spectral confirmation not obtained-result suspect.

CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards (2014) listed in Appendix J of Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ in the Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002, reissued August 16, 2014).
The first Corrective Action Monitoring Event occurred Second Quarter 2010.
"–" denotes not sampled.

Note:

APPENDIX A-3

HWMU-5 2015 LABORATORY ANALYTICAL RESULTS
GROUNDWATER CORRECTIVE ACTION ANNUAL MONITORING LIST

Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Antimony						*CAS # 7440-36-0*							
Second Quarter 2015	-	U	U	U	U	U	2	1	6	0.4	0.4	ug/l	6020A
Arsenic						*CAS # 7440-38-2*							
Second Quarter 2015	-	U	U	U	U	U	10	10	10	2	2	ug/l	6020A
Barium						*CAS # 7440-39-3*							
Second Quarter 2015	-	26	40.3	13.6	31.3	34.3	10	10	2,000	1	1	ug/l	6020A
Beryllium						*CAS # 7440-41-7*							
Second Quarter 2015	-	U	U	0.912 J	U	U	1	1	4	0.2	0.2	ug/l	6020A
Cadmium						*CAS # 7440-43-9*							
Second Quarter 2015	-	U	U	0.548 J	0.315 J	0.318 J	1	1	5	0.2	0.2	ug/l	6020A
Chromium						*CAS # 7440-47-3*							
Second Quarter 2015	-	U	U	4.17 J	U	2.87 J	5	5	100	1	1	ug/l	6020A
Cobalt						*CAS # 7440-48-4*							
Second Quarter 2015	U	U	2.34 J	64.9	17	11.1	5	5	7	1	1	ug/l	6020A
Fourth Quarter 2015	U	U	2.25 J	75.2	23.9	7.08	5	5	7	1	1	ug/l	6020A
Copper						*CAS # 7440-50-8*							
Second Quarter 2015	-	1.64 J	1.52 J	3.93 J	U	2.98 J	5	5	1,300	1	1	ug/l	6020A
Lead						*CAS # 7439-92-1*							
Second Quarter 2015	-	0.774 J	0.603 J	U	0.202 J	0.827 J	1	1	15	0.2	0.2	ug/l	6020A
Mercury						*CAS # 7439-97-6*							
Second Quarter 2015	-	U	U	U	U	U	2	2	2	0.2	0.2	ug/l	7470A
Nickel						*CAS # 7440-02-0*							
Second Quarter 2015	-	2.15 J	U	33.9	7.22 J	8.86 J	10	10	300	2	2	ug/l	6020A
Selenium						*CAS # 7782-49-2*							
Second Quarter 2015	-	U	U	U	U	U	10	10	50	3	3	ug/l	6020A
Silver						*CAS # 7440-22-4*							
Second Quarter 2015	-	U	U	U	U	U	2	2	71	0.2	0.2	ug/l	6020A
Thallium						*CAS # 7440-28-0*							
Second Quarter 2015	-	0.318 J	U	U	U	U	1	1	2	0.2	0.2	ug/l	6020A
Vanadium						*CAS # 7440-62-2*							
Second Quarter 2015	-	U	U	1.26 J	U	3.76 J	10	10	63	1	1	ug/l	6020A

See last page of this report for definitions.

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Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Zinc						*CAS # 7440-66-6*							
Second Quarter 2015	-	7.11 J	16.7	30.3	6.89 J	12.1	10	10	4700	3	3	ug/l	6020A
Acetone						*CAS # 67-64-1*							
Second Quarter 2015	-	12	U	U	U	U	10	10	12000	3	3	ug/l	8260C
bis(2-Ethylhexyl)phthalate						*CAS # 117-81-7*							
Second Quarter 2015	-	U	U	U	U	U	6	6	10	1.5	1.5	ug/l	8270D
2-Butanone						*CAS # 78-93-3*							
Second Quarter 2015	-	U	U	U	U	U	10	10	4900	1	1	ug/l	8260C
Chloroform						*CAS # 67-66-3*							
Second Quarter 2015	-	1.2 J	25 J	1.1 J	0.6 J	0.8 J	1	1	80	0.1	0.1	ug/l	8260C
Dichlorodifluoromethane						*CAS # 75-71-8*							
Second Quarter 2015	-	U	U	U	U	U	1	1	190	0.3	0.28	ug/l	8260C
1,2-Dichloroethane						*CAS # 107-06-2*							
Second Quarter 2015	-	U	U	U	U	U	1	1	5	0.1	0.147	ug/l	8260C
Diethyl ether						*CAS # 60-29-7*							
Second Quarter 2015	-	U	U	1.4 J	4.5 J	11 J	12	12	7,300	0.4	0.39	ug/l	8260C
Diethyl phthalate						*CAS # 84-66-2*							
Second Quarter 2015	-	U	U	U	U	U	10	10	11000	0.52	0.5	ug/l	8270D
2,4-Dinitrotoluene						*CAS # 121-14-2*							
Second Quarter 2015	-	U	U	3 J	2.8 J	2.8 J	10	10	10	0.84	0.6	ug/l	8270D
2,6-Dinitrotoluene						*CAS # 606-20-2*							
Second Quarter 2015	-	U	U	U	U	U	10	10	10	0.75	0.7	ug/l	8270D
Methylene chloride						*CAS # 75-09-2*							
Second Quarter 2015	-	U	U	U	U	U	1	1	5	0.2	0.182	ug/l	8260C
o-Nitroaniline						*CAS # 88-74-4*							
Second Quarter 2015	-	U	U	U	U	U	10	10	150	1.5	0.7	ug/l	8270D
p-Nitroaniline						*CAS # 100-01-6*							
Second Quarter 2015	-	U	U	U	U	U	20	20	20	2.7	1.3	ug/l	8270D
Nitrobenzene						*CAS # 98-95-3*							
Second Quarter 2015	-	U	U	U	U	U	10	10	10	1.3	0.8	ug/l	8270D

See last page of this report for definitions.

Summary of Annual Target Analyte Monitoring Results - Appendix K
Corrective Action Monitoring Plan - Targeted Constituents
Hazardous Waste Management Unit 5
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 5W8B

Analyte/Quarter	*5W8B Q*	*5W5B Q*	*5W7B Q*	*5WC21 Q*	*5WC22 Q*	*5WC23 Q*	*QL*	*Permit QL*	*GPS*	*DL*	*Permit DL*	*UNIT*	*Method*
Toluene						*CAS # 108-88-3*							
Second Quarter 2015	-	U	U	U	U	U	1	1	1,000	0.1	0.1	ug/l	8260C
Xylenes (Total)						*CAS # 1330-20-7*							
Second Quarter 2015	-	U	U	U	U	U	3	3	10,000	0.2	0.208	ug/l	8260C

Definitions:

Results are reported to the Permit Detection Limit.
First Corrective Action Monitoring Event Second Quarter 2010:

QL: Denotes laboratory quantitation limit.
Permit QL: Denotes permit quantitation limit.
DL: Denotes laboratory detection limit.
Permit DL: Denotes permit detection limit.
U: Denotes not detected at or above the permit detection limit or QL.
UA: Denotes not detected at or above the adjusted detection limit or adjusted QL.
J: Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit or QL and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN: Denotes analyte concentration is less than the QL and/or five times the blank concentration. Not reliably detected due to blank contamination.
R: Denotes result rejected.
Q: Denotes data validation qualifier.
X: Denotes mass spectral confirmation not obtained - result suspect.

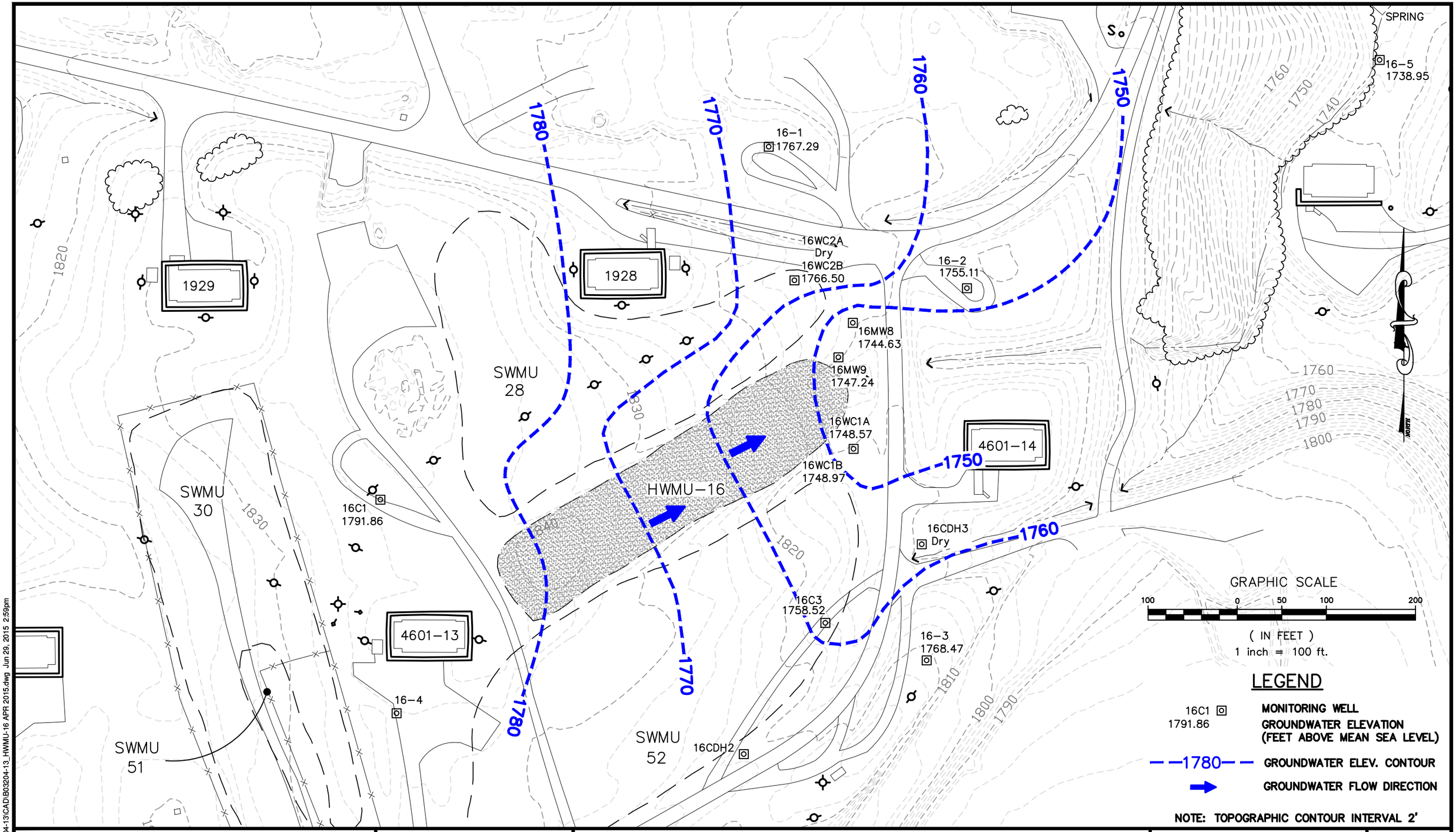
CAS#: Denotes Chemical Abstract Services registration number.
GPS: Denotes Groundwater Protection Standards listed in Appendix K of Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5 (approved by the VDEQ and incorporated into the Final Hazardous Waste Post-Closure Permit for Hazardous Waste Units 5 and 16 (original effective date October 4, 2002 and reissued August 16, 2014)
"–": Denotes not sampled.

APPENDIX B

HWMU-16

APPENDIX B-1

HWMU-16 POTENTIOMETRIC SURFACE MAPS
SECOND QUARTER 2015
FOURTH QUARTER 2015



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Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED	RGM
DRAWN	DLD
CHECKED	SN
DATE	06/29/2015

HWMU-16 POTENTIOMETRIC SURFACE MAP - APRIL 21, 2015
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

SCALE: 1"=100'

PLAN NO. B03204-13

FIGURE 2

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SPRING

16-5
1738.54

16-1
1768.73

16WC2A
Dry
16WC2B
1765.55

16-2
1755.08

16MW8
1743.40

16MW9
1745.06

16WC1A
1746.42

16WC1B
1746.67

16C1
1790.60

16C3
1754.91

16CDH3
Dry

16CDH2

16-3
1768.23

16-4

1929

1928

4601-14

4601-13

SWMU
28

SWMU
30

SWMU
51

SWMU
52

HWMU-16

1780

1770

1760

1750

1740

1790

1800

1810

1820

1830

1840

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 inch = 100 ft.

LEGEND

16C1 ⊡ 1790.60 — MONITORING WELL GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)

1780 — GROUNDWATER ELEV. CONTOUR

GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

Draper Aden Associates
Engineering • Surveying • Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED	WMD
DRAWN	DLD
CHECKED	SN
DATE	12/02/2015

HWMU-16 POTENTIOMETRIC SURFACE MAP - OCTOBER 13, 2015
RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

SCALE: 1"=100'

PLAN NO. B03204-13A

FIGURE 2

P:\B03\200\B03204\B03204-13\CAD\B03204-13_HWMU-16 OCT 2015.dwg Dec 02, 2015 1:45pm

APPENDIX B-2

HWMU-16 2015 LABORATORY ANALYTICAL RESULTS
POINT OF COMPLIANCE WELLS

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Antimony					*CAS #* ***7440-36-0***			
Second Quarter 2015	U	U	U	U	U	2	-	6020A
Arsenic					*CAS #* ***7440-38-2***			
Second Quarter 2015	U	U	U	U	U	10	10	6020A
Fourth Quarter 2015	U	U	U	U	U	10	10	6020A
Barium					*CAS #* ***7440-39-3***			
Second Quarter 2015	167	139	561	257	130	10	2000	6020A
Fourth Quarter 2015	201	141	554	239	145	10	2000	6020A
Beryllium					*CAS #* ***7440-41-7***			
Second Quarter 2015	U	0.341 J	U	U	U	1	4	6020A
Fourth Quarter 2015	U	U	U	U	U	1	4	6020A
Cadmium					*CAS #* ***7440-43-9***			
Second Quarter 2015	U	0.235 J	U	U	0.251 J	1	5	6020A
Fourth Quarter 2015	U	U	U	U	U	1	5	6020A
Chromium					*CAS #* ***7440-47-3***			
Second Quarter 2015	U	U	U	U	U	5	100	6020A
Fourth Quarter 2015	U	U	U	U	U	5	100	6020A
Cobalt					*CAS #* ***7440-48-4***			
Second Quarter 2015	U	1.25 J	4.84 J	4.3 J	22.3	5	5	6020A
Fourth Quarter 2015	U	U	U	5.38	17	5	5	6020A
Copper					*CAS #* ***7440-50-8***			
Second Quarter 2015	U	16.9	U	U	U	5	1300	6020A
Fourth Quarter 2015	U	10.9	U	U	U	5	1300	6020A
Lead					*CAS #* ***7439-92-1***			
Second Quarter 2015	U	0.769 J	U	U	U	1	15	6020A
Fourth Quarter 2015	U	U	U	U	U	1	15	6020A
Mercury					*CAS #* ***7439-97-6***			
Second Quarter 2015	U	U	U	U	U	2	2	7470A
Fourth Quarter 2015	U	U	U	U	U	2	2	7470A
Nickel					*CAS #* ***7440-02-0***			
Second Quarter 2015	4.99 J	4.21 J	18.7	8.44 J	7 J	10	300	6020A
Fourth Quarter 2015	U	U	15.3	U	U	10	300	6020A
Selenium					*CAS #* ***7782-49-2***			
Second Quarter 2015	U	U	U	U	U	5	-	6020A
Silver					*CAS #* ***7440-22-4***			
Second Quarter 2015	U J	U J	U J	U J	U J	1	-	6020A
Thallium					*CAS #* ***7440-28-0***			
Second Quarter 2015	U	U	U	U	U	1	-	6020A
Vanadium					*CAS #* ***7440-62-2***			
Second Quarter 2015	U	U	U	U	U	10	151	6020A
Fourth Quarter 2015	U	U	U	U	U	10	151	6020A
Zinc					*CAS #* ***7440-66-6***			
Second Quarter 2015	3.13 J	54.9	U	5.31 J	8.29 J	10	4700	6020A
Fourth Quarter 2015	U	31.1	U	U	U	10	4700	6020A
Cyanide					*CAS #* ***57-12-5***			
Second Quarter 2015	U	U	U	U	U	20	-	9012B
Acenaphthene					*CAS #* ***83-32-9***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Acenaphthylene					*CAS #* ***208-96-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Acetone					*CAS #* ***67-64-1***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Acetonitrile					*CAS #* ***75-05-8***			
Second Quarter 2015	U	U	U	U	U	100	-	8260C
Acetophenone					*CAS #* ***98-86-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
2-Acetylaminofluorene					*CAS #* ***53-96-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Acrolein					*CAS #* ***107-02-8***			
Second Quarter 2015	U J	U J	U J	U J	U J	25	-	8260C
Acrylonitrile					*CAS #* ***107-13-1***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Allyl chloride					*CAS #* ***107-05-1***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
4-Aminobiphenyl					*CAS #* ***92-67-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Aniline					*CAS #* ***62-53-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Anthracene					*CAS #* ***120-12-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Aramite					*CAS #* ***140-57-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Benzene					*CAS #* ***71-43-2***			
Second Quarter 2015	0.3 J	U	0.3 J	0.1 J	U	1	5	8260C
Fourth Quarter 2015	U	U	U	U	U	1	5	8260C
Benzo[a]anthracene					*CAS #* ***56-55-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Benzo[b]fluoranthene					*CAS #* ***205-99-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Benzo[k]fluoranthene					*CAS #* ***207-08-9***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Benzo[ghi]perylene					*CAS #* ***191-24-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Benzo(a)pyrene					*CAS #* ***50-32-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
1,4-Benzenediamine					*CAS #* ***106-50-3***			
Second Quarter 2015	U J	U J	U J	U J	U J	10	-	8270D
Benzyl alcohol					*CAS #* ***100-51-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
bis(2-Chloroethoxy)methane					*CAS #* ***111-91-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
bis(2-Chloroethyl)ether					*CAS #* ***111-44-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
bis(2-Chloro-1-methylethyl)ether					*CAS #* ***108-60-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
bis(2-Ethylhexyl)phthalate					*CAS #* ***117-81-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Bromodichloromethane					*CAS #* ***75-27-4***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Bromoform					*CAS #* ***75-25-2***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
4-Bromophenyl phenyl ether					*CAS #* ***101-55-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Butanone					*CAS #* ***78-93-3***			
Second Quarter 2015	U	U	U	U	U	10	4900	8260C
Fourth Quarter 2015	U	U	U	U	U	10	4900	8260C
Butyl benzyl phthalate					*CAS #* ***85-68-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Carbon disulfide					*CAS #* ***75-15-0***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Carbon tetrachloride					*CAS #* ***56-23-5***			
Second Quarter 2015	U	U	U	U	U	1	5	8260C
Fourth Quarter 2015	U	U	U	U	U	1	5	8260C

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
p-Chloroaniline					*CAS #* ***106-47-8***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Chlorobenzilate					*CAS #* ***510-15-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
p-Chloro-m-cresol					*CAS #* ***59-50-7***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Chloroethane					*CAS #* ***75-00-3***			
Second Quarter 2015	4.9	U	2.7	0.9 J	U	1	21000	8260C
Fourth Quarter 2015	4.8	U	2.5	U	U	1	21000	8260C
Chloroform					*CAS #* ***67-66-3***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
2-Chloronaphthalene					*CAS #* ***91-58-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Chlorophenol					*CAS #* ***95-57-8***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
4-Chlorophenyl phenyl ether					*CAS #* ***7005-72-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Chloroprene					*CAS #* ***126-99-8***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Chrysene					*CAS #* ***218-01-9***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Diallate					*CAS #* ***2303-16-4***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Dibenz(a,h)anthracene					*CAS #* ***53-70-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Dibenzofuran					*CAS #* ***132-64-9***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Dibromochloromethane					*CAS #* ***124-48-1***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,2-Dibromo-3-chloropropane					*CAS #* ***96-12-8***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,2-Dibromoethane					*CAS #* ***106-93-4***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Di-n-butyl phthalate					*CAS #* ***84-74-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
1,2-Dichlorobenzene					*CAS #* ***95-50-1***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,3-Dichlorobenzene					*CAS #* ***541-73-1***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,4-Dichlorobenzene					*CAS #* ***106-46-7***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
3,3'-Dichlorobenzidine					*CAS #* ***91-94-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
trans-1,4-Dichloro-2-butene					*CAS #* ***110-57-6***			
Second Quarter 2015	U J	U J	U J	U J	U J	10	-	8260C
Dichlorodifluoromethane					*CAS #* ***75-71-8***			
Second Quarter 2015	0.2 J	U	U	U	U	1	190	8260C
Fourth Quarter 2015	U	U	U	U	U	1	190	8260C
1,1-Dichloroethane					*CAS #* ***75-34-3***			
Second Quarter 2015	7.6	0.3 J	7.9	2.4	U	1	9.5	8260C
Fourth Quarter 2015	7.7	U	7.4	1.8	U	1	9.5	8260C
1,2-Dichloroethane					*CAS #* ***107-06-2***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,1-Dichloroethene					*CAS #* ***75-35-4***			
Second Quarter 2015	0.3 J	U	U	U	U	1	7	8260C
Fourth Quarter 2015	U	U	U	U	U	1	7	8260C

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
trans-1,2-Dichloroethene					*CAS #* ***156-60-5***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
2,4-Dichlorophenol					*CAS #* ***120-83-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
2,6-Dichlorophenol					*CAS #* ***87-65-0***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
1,2-Dichloropropane					*CAS #* ***78-87-5***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,3-Dichloropropane					*CAS #* ***142-28-9***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
trans-1,3-Dichloropropene					*CAS #* ***10061-02-6***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Diethyl ether					*CAS #* ***60-29-7***			
Second Quarter 2015	44 J	7.7 J	50 J	14 J	U J	13	7300	8260C
Fourth Quarter 2015	55 J	13 J	50 J	16 J	U J	12.5	7300	8260C
Diethyl phthalate					*CAS #* ***84-66-2***			
Second Quarter 2015	U	U	0.89 J	U	U	5	11000	8270D
Fourth Quarter 2015	U	U	U	U	U	5	11000	8270D
O,O-Diethyl O-2-pyrazinyl					*CAS #* ***297-97-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Dimethoate					*CAS #* ***60-51-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Dimethyl ether					*CAS #* ***115-10-6***			
Second Quarter 2015	11 J	0.3 J	1.1 J	1 J	0.2 J	13	17	8260C
Fourth Quarter 2015	U J	U J	U J	U J	U J	12.5	17	8260C
p-(Dimethylamino)azobenzene					*CAS #* ***60-11-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
7,12-Dimethylbenz[a]anthracene					*CAS #* ***57-97-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
3,3'-Dimethylbenzidine					*CAS #* ***119-93-7***			
Second Quarter 2015	U J	U J	U J	U J	U J	5	-	8270D
a,a-Dimethylphenethylamine					*CAS #* ***122-09-8***			
Second Quarter 2015	U J	U J	U J	U J	U J	15	-	8270D
2,4-Dimethylphenol					*CAS #* ***105-67-9***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Dimethyl phthalate					*CAS #* ***131-11-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
m-Dinitrobenzene					*CAS #* ***99-65-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
4,6-Dinitro-o-cresol					*CAS #* ***534-52-1***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
2,4-Dinitrophenol					*CAS #* ***51-28-5***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
2,4-Dinitrotoluene					*CAS #* ***121-14-2***			
Second Quarter 2015	U	U	U	U	U	10	10	8270D
Fourth Quarter 2015	U	U	U	U	U	10	10	8270D
2,6-Dinitrotoluene					*CAS #* ***606-20-2***			
Second Quarter 2015	U	U	U	U	U	10	10	8270D
Fourth Quarter 2015	U	U	U	U	U	10	10	8270D
Di-n-octyl phthalate					*CAS #* ***117-84-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
1,4-Dioxane					*CAS #* ***123-91-1***			
Second Quarter 2015	U	U	U	U	U	200	-	8260C
Diphenylamine					*CAS #* ***122-39-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Disulfoton					*CAS #* ***298-04-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Ethylbenzene					*CAS #* ***100-41-4***			
Second Quarter 2015	U	U	U	U	U	1	700	8260C
Fourth Quarter 2015	U	U	U	U	U	1	700	8260C
Ethyl methacrylate					*CAS #* ***97-63-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Ethyl methanesulfonate					*CAS #* ***62-50-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Famphur					*CAS #* ***52-85-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Fluoranthene					*CAS #* ***206-44-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Fluorene					*CAS #* ***86-73-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Hexachlorobenzene					*CAS #* ***118-74-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Hexachlorobutadiene					*CAS #* ***87-68-3***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Hexachlorocyclopentadiene					*CAS #* ***77-47-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Hexachloroethane					*CAS #* ***67-72-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Hexachlorophene					*CAS #* ***70-30-4***			
Second Quarter 2015	U	U	U	U	U	100	-	8270D
Hexachloropropene					*CAS #* ***1888-71-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Hexanone					*CAS #* ***591-78-6***			
Second Quarter 2015	U J	U J	U J	U J	U J	10	-	8260C
Indeno[1,2,3-cd]pyrene					*CAS #* ***193-39-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Isobutyl alcohol					*CAS #* ***78-83-1***			
Second Quarter 2015	U	U	U	U	U	200	-	8260C
Isodrin					*CAS #* ***465-73-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Isophorone					*CAS #* ***78-59-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Isosafrole					*CAS #* ***120-58-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Kepone					*CAS #* ***143-50-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Methacrylonitrile					*CAS #* ***126-98-7***			
Second Quarter 2015	U	U	U	U	U	100	-	8260C
Methapyrilene					*CAS #* ***91-80-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Bromomethane					*CAS #* ***74-83-9***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Chloromethane					*CAS #* ***74-87-3***			
Second Quarter 2015	U	U	U	U	U	1	190	8260C
Fourth Quarter 2015	U	U	U	U	U	1	190	8260C
3-Methylcholanthrene					*CAS #* ***56-49-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Iodomethane					*CAS #* ***74-88-4***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Methyl methacrylate					*CAS #* ***80-62-6***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
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Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Methyl methane sulfonate					*CAS #* ***66-27-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Methylnaphthalene					*CAS #* ***91-57-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Methyl parathion					*CAS #* ***298-00-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
4-Methyl-2-pentanone					*CAS #* ***108-10-1***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
2-Methylphenol					*CAS #* ***95-48-7***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
3 & 4-Methylphenol					*CAS #* ***m 108-39-4 p 106-44-5***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Dibromomethane					*CAS #* ***74-95-3***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Methylene chloride					*CAS #* ***75-09-2***			
Second Quarter 2015	2.6	U	U	U	U	1	13.95	8260C
Fourth Quarter 2015	1.7	U	U	U	U	1	13.95	8260C
Naphthalene					*CAS #* ***91-20-3***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,4-Naphthoquinone					*CAS #* ***130-15-4***			
Second Quarter 2015	U J	U J	U J	U J	U J	5	-	8270D
1-Naphthylamine					*CAS #* ***134-32-7***			
Second Quarter 2015	U J	U J	U J	U J	U J	5	-	8270D
2-Naphthylamine					*CAS #* ***91-59-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
o-Nitroaniline					*CAS #* ***88-74-4***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
m-Nitroaniline					*CAS #* ***99-09-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
p-Nitroaniline					*CAS #* ***100-01-6***			
Second Quarter 2015	U J	U J	U J	U J	U J	10	-	8270D
Nitrobenzene					*CAS #* ***98-95-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
o-Nitrophenol					*CAS #* ***88-75-5***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
p-Nitrophenol					*CAS #* ***100-02-7***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
4-Nitroquinoline-1-oxide					*CAS #* ***56-57-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosodi-n-butylamine					*CAS #* ***924-16-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosodiethylamine					*CAS #* ***55-18-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosodimethylamine					*CAS #* ***62-75-9***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosodiphenylamine					*CAS #* ***86-30-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosodipropylamine					*CAS #* ***621-64-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosomethylethylamine					*CAS #* ***10595-95-6***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosomorpholine					*CAS #* ***59-89-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosopiperidine					*CAS #* ***100-75-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
N-Nitrosopyrrolidine					*CAS #* ***930-55-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
5-Nitroso-o-toluidine					*CAS #* ***99-55-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Parathion					*CAS #* ***56-38-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Pentachlorobenzene					*CAS #* ***608-93-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Pentachloroethane					*CAS #* ***76-01-7***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Pentachloronitrobenzene					*CAS #* ***82-68-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Pentachlorophenol					*CAS #* ***87-86-5***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Phenacetin					*CAS #* ***62-44-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Phenanthrene					*CAS #* ***85-01-8***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Phenol					*CAS #* ***108-95-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Phorate					*CAS #* ***298-02-2***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Picoline					*CAS #* ***931-19-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Pronamide					*CAS #* ***23950-58-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
2-Propanol					*CAS #* ***67-63-0***			
Second Quarter 2015	U	U	U	U	U	100	-	8260C
Propionitrile					*CAS #* ***107-12-0***			
Second Quarter 2015	U	U	U	U	U	100	-	8260C
Pyrene					*CAS #* ***129-00-0***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Pyridine					*CAS #* ***110-86-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Safrole					*CAS #* ***94-59-7***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Styrene					*CAS #* ***100-42-5***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Sulfotep					*CAS #* ***3689-24-5***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
1,2,4,5-Tetrachlorobenzene					*CAS #* ***95-94-3***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
1,1,1,2-Tetrachloroethane					*CAS #* ***630-20-6***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,1,2,2-Tetrachloroethane					*CAS #* ***79-34-5***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Tetrachloroethene					*CAS #* ***127-18-4***			
Second Quarter 2015	0.3 J	U	U	U	U	1	5	8260C
Fourth Quarter 2015	U	U	U	U	U	1	5	8260C
Tetrahydrofuran					*CAS #* ***109-99-9***			
Second Quarter 2015	14 J	U	U	U	U	25	-	8260C
2,3,4,6-Tetrachlorophenol					*CAS #* ***58-90-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
Toluene					*CAS #* ***108-88-3***			
Second Quarter 2015	U	U	U	U	U	1	1000	8260C
Fourth Quarter 2015	U	U	U	U	U	1	1000	8260C
o-Toluidine					*CAS #* ***95-53-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
1,2,4-Trichlorobenzene					*CAS #* ***120-82-1***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,1,1-Trichloroethane					*CAS #* ***71-55-6***			
Second Quarter 2015	0.3 J	U	U	U	U	1	200	8260C
Fourth Quarter 2015	U	U	U	U	U	1	200	8260C
1,1,2-Trichloroethane					*CAS #* ***79-00-5***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Trichloroethene					*CAS #* ***79-01-6***			
Second Quarter 2015	0.3 J	U	U	U	U	1	5	8260C
Fourth Quarter 2015	U	U	U	U	U	1	5	8260C
Trichlorofluoromethane					*CAS #* ***75-69-4***			
Second Quarter 2015	U	U	U	U	U	1	1000	8260C
Fourth Quarter 2015	U	U	U	U	U	1	1000	8260C
2,4,5-Trichlorophenol					*CAS #* ***95-95-4***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
2,4,6-Trichlorophenol					*CAS #* ***88-06-2***			
Second Quarter 2015	U	U	U	U	U	10	-	8270D
1,2,3-Trichloropropane					*CAS #* ***96-18-4***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
1,1,2-Trichloro-1,2,2-Trifluoroethane					*CAS #* ***76-13-1***			
Second Quarter 2015	U	U	U	U	U	1	59000	8260C
Fourth Quarter 2015	U	U	U	U	U	1	59000	8260C
O,O,O-Triethyl phosphorothioate					*CAS #* ***126-68-1***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
sym-Trinitrobenzene					*CAS #* ***99-35-4***			
Second Quarter 2015	U	U	U	U	U	5	-	8270D
Vinyl acetate					*CAS #* ***108-05-4***			
Second Quarter 2015	U	U	U	U	U	10	-	8260C
Vinyl chloride					*CAS #* ***75-01-4***			
Second Quarter 2015	U	U	U	U	U	1	-	8260C
Xylenes (Total)					*CAS #* ***1330-20-7***			
Second Quarter 2015	U	U	U	U	U	3	10000	8260C
Fourth Quarter 2015	U	U	U	U	U	3	10000	8260C

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 ***All Results in ug/L.***

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*

Definitions:

The following definitions apply to results reported for Appendix IX monitoring events. All Appendix IX monitoring results for compliance wells are reported to the detection limit.

Appendix IX Monitoring Events: 3Q2003, 2Q-2004, 2Q-2005, 3Q2006, 2Q2007, 2Q2008, 2Q2009, 2Q 2010, 2Q 2011, 2Q 2012, 2Q2013, 2Q2014, 2Q2015

QL Denotes permit required quantitation limit.
U denotes not detected at or above the detection limit.
UA denotes not detected at or above the adjusted detection limit.
J Denotes result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above the detection limit and detection limit and QL are estimated. When used with "UA" (i.e., "UAJ"), denotes analyte not detected at or above adjusted detection limit and adjusted detection limit and QL are estimated.
UN Denotes analyte concentration is less than the quantitation limit and/or five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.
R Denotes result rejected.
Q Denotes data validation qualifier. **X** Denotes mass spectral confirmation not obtained-result suspect.
Background Denotes background concentrations listed in Appendix F to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (rev 2014), where applicable.
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002) (revised 2014).
NS denotes not sampled. **NA** denotes not analyzed.
"–" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

The following definitions apply to results reported for non-Appendix IX monitoring events. All non-Appendix IX monitoring results for compliance wells are reported at or above the quantitation limit.

QL Denotes permit required quantitation limit.
U Denotes analyte not detected at or above QL.
UA Denotes analyte not detected at or above adjusted sample QL.
J Denotes result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
R Denotes result rejected.
Q Denotes data validation qualifier.
Background Denotes background concentrations listed in Appendix F to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002), (revised 2014), where applicable.
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5 and 16 (October 4, 2002) (revised 2014).

APPENDIX B-3

HWMU-16 2015 LABORATORY ANALYTICAL RESULTS
PLUME MONITORING WELLS

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells
Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L. ***Upgradient well = 16C1***

Analtye/Quarter	*16C1 Q*	*16-2 Q*	*16-3 Q*	*16-5 Q*	*16WC2B Q*	*16SPRING Q*	*QL*	*Background*	*Method*
Arsenic						*CAS #7440-38-2*			
Second Quarter 2015	U	U	U	U	U	U	10	1	6020A
Fourth Quarter 2015	U	U	U	U	U	U	10	1	6020A
Barium						*CAS #7440-39-3*			
Second Quarter 2015	167	207	695	163	116	195	10	175.4	6020A
Fourth Quarter 2015	201	231	755	182	120	219	10	175.4	6020A
Beryllium						*CAS #7440-41-7*			
Second Quarter 2015	U	U	U	U	U	U	1	0.7	6020A
Fourth Quarter 2015	U	U	U	U	U	U	1	0.7	6020A
Cadmium						*CAS #7440-43-9*			
Second Quarter 2015	U	U	U	U	U	U	1	0.2	6020A
Fourth Quarter 2015	U	U	U	U	U	U	1	0.2	6020A
Chromium						*CAS #7440-47-3*			
Second Quarter 2015	U	U	U	U	U	U	5	6.2	6020A
Fourth Quarter 2015	U	U	U	U	U	U	5	6.2	6020A
Cobalt						*CAS #7440-48-4*			
Second Quarter 2015	U	U	U	U	U	U	5	5	6020A
Fourth Quarter 2015	U	U	U	U	U	U	5	5	6020A
Copper						*CAS #7440-50-8*			
Second Quarter 2015	U	U	U	U	U	U	5	13	6020A
Fourth Quarter 2015	U	U	U	U	U	U	5	13	6020A
Lead						*CAS #7439-92-1*			
Second Quarter 2015	U	U	U	U	U	U	1	10	6020A
Fourth Quarter 2015	U	U	U	U	U	U	1	10	6020A
Mercury						*CAS #7439-97-6*			
Second Quarter 2015	U	U	U	U	U	U	2	0.2	7470A
Fourth Quarter 2015	U	U	U	U	U	U	2	0.2	7470A
Nickel						*CAS #7440-02-0*			
Second Quarter 2015	4.99 J	U	U	U	U	U	10	16	6020A
Fourth Quarter 2015	U	U	U	U	U	U	10	16	6020A
Vanadium						*CAS #7440-62-2*			
Second Quarter 2015	U	U	U	U	U	U	10	151	6020A
Fourth Quarter 2015	U	U	U	U	U	U	10	151	6020A
Zinc						*CAS #7440-66-6*			
Second Quarter 2015	3.13 J	U	U	U	U	U	10	51	6020A
Fourth Quarter 2015	U	14.1	12.9	U	U	U	10	51	6020A
Benzene						*CAS #71-43-2*			
Second Quarter 2015	0.3 J	U	U	U	U	U	1	1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	1	8260C
2-Butanone						*CAS #78-93-3*			
Second Quarter 2015	U	U	U	U	U	U	10	1.1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	10	1.1	8260C
Carbon tetrachloride						*CAS #56-23-5*			
Second Quarter 2015	U	U	U	U	U	U	1	0.2	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.2	8260C
Chloroethane						*CAS #75-00-3*			
Second Quarter 2015	4.9	U	U	U	U	U	1	20.7	8260C
Fourth Quarter 2015	4.8	U	U	U	U	U	1	20.7	8260C

See last page of this report for definitions.

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells
Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L. ***Upgradient well = 16C1***

Analtye/Quarter	*16C1 Q*	*16-2 Q*	*16-3 Q*	*16-5 Q*	*16WC2B Q*	*16SPRING Q*	*QL*	*Background*	*Method*
Dichlorodifluoromethane						*CAS #75-71-8*			
Second Quarter 2015	0.2 J	U	U	U	U	U	1	46.5	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	46.5	8260C
1,1-Dichloroethane						*CAS #75-34-3*			
Second Quarter 2015	7.6	U	U	U	U	U	1	9.5	8260C
Fourth Quarter 2015	7.7	U	U	U	U	U	1	9.5	8260C
1,1-Dichloroethene						*CAS #75-35-4*			
Second Quarter 2015	0.3 J	U	U	U	U	U	1	1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	1	8260C
Diethyl ether						*CAS #60-29-7*			
Second Quarter 2015	44 J	U J	U J	U J	U J	U J	13	75.5	8260C
Fourth Quarter 2015	55 J	U J	U J	U J	U J	U J	12.5	75.5	8260C
Diethyl phthalate						*CAS #84-66-2*			
Second Quarter 2015	U	U	U	U	U	U	5	5	8270D
Fourth Quarter 2015	U	U	U	U	U	U	5	5	8270D
Dimethyl ether						*CAS #115-10-6*			
Second Quarter 2015	11 J	U	U	U	U	U	13	17.0	8260C
Fourth Quarter 2015	U J	U J	U J	U J	U J	U J	12.5	17.0	8260C
2,4-Dinitrotoluene						*CAS #121-14-2*			
Second Quarter 2015	U	U	U	U	U	U	10	10	8270D
Fourth Quarter 2015	U	U	U	U	U	U	10	10	8270D
2,6-Dinitrotoluene						*CAS #606-20-2*			
Second Quarter 2015	U	U	U	U	U	U	10	10	8270D
Fourth Quarter 2015	U	U	U	U	U	U	10	10	8270D
Ethylbenzene						*CAS #100-41-4*			
Second Quarter 2015	U	U	U	U	U	U	1	0.1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.1	8260C
Chloromethane						*CAS #74-87-3*			
Second Quarter 2015	U	U	U	U	U	U	1	0.3	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.3	8260C
Methylene chloride						*CAS #75-09-2*			
Second Quarter 2015	2.6	U	U	U	U	U	1	13.95	8260C
Fourth Quarter 2015	1.7	U	U	U	U	U	1	13.95	8260C
Tetrachloroethene						*CAS #127-18-4*			
Second Quarter 2015	0.3 J	U	U	U	U	U	1	0.7	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.7	8260C
Toluene						*CAS #108-88-3*			
Second Quarter 2015	U	U	U	U	U	U	1	0.1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.1	8260C
1,1,1-Trichloroethane						*CAS #71-55-6*			
Second Quarter 2015	0.3 J	U	U	U	U	U	1	9.2	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	9.2	8260C
Trichloroethene						*CAS #79-01-6*			
Second Quarter 2015	0.3 J	U	U	U	U	U	1	0.1	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	0.1	8260C
Trichlorofluoromethane						*CAS #75-69-4*			
Second Quarter 2015	U	U	U	U	U	U	1	11.3	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	11.3	8260C

Target Analyte Monitoring Results At Or Above Permit Quantitation Limit
HWMU-16 Plume Monitoring Wells
Radford Army Ammunition Plant, Radford, Virginia

All Results in ug/L.

Upgradient well = 16C1

Analtye/Quarter	*16C1 Q*	*16-2 Q*	*16-3 Q*	*16-5 Q*	*16WC2B Q*	*16SPRING Q*	*QL*	*Background*	*Method*
1,1,2-Trichloro-1,2,2-Trifluoroethane						*CAS #76-13-1*			
Second Quarter 2015	U	U	U	U	U	U	1	1.2	8260C
Fourth Quarter 2015	U	U	U	U	U	U	1	1.2	8260C
Xylenes (Total)						*CAS #1330-20-7*			
Second Quarter 2015	U	U	U	U	U	U	3	0.2	8260C
Fourth Quarter 2015	U	U	U	U	U	U	3	0.2	8260C

Definitions:

All plume monitoring well results reported to at or above the permit quantitation limit except for the upgradient well during the Appendix IX monitoring Event. During this event, results for the upgradient well are reported to the detection limit.

Q Denotes data validation qualifier.
QL Denotes permit required quantitation limit.
U Denotes analyte not detected at or above QL.
UA Denotes analyte not detected at or above adjusted sample QL.
J Denotes result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
UN Denotes analyte concentration is less than the quantiation limit and five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when compliance well results are reported to at or above the project detection limit.
R Denotes result rejected.
Background Denotes background concentrations listed in Appendix F to Attachment 3 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002), revised July 17, 2014).
CAS# Denotes Chemical Abstract Services registration number.
GPS Denotes groundwater protection standard. (2014)

NS denotes not sampled. **NA** denotes not analyzed. "–"denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Notes:
4Q2004. No data for 16-1 8270C-semivolatiles. Well dry-insufficient sample volume.
4Q2006 - No data for 16-1; well dry.
4Q2008- No data for 16-1; well dry.
2Q2009- No data for 16-1; well dry.

NOTE:
Fourth Quarter 2008
Due to laboratory error all HWMU 16 samples were analyzed using Method 8260B 5 ml purge instead of a 25 ml purge which resulted in a higher QL. For these samples, all results were evaluated to the detection limit, which is comparable to the permit QL. Results below the laboratory QL but at or above the permit QL are reported and qualified as estimated.

APPENDIX B-4

ESTABLISHED BACKGROUND VALUES AND COMPUTATIONS FOR HWMU-16

- It was not understood why the majority of fluorescein detections were considered false positive detections. The basis of this observation is unclear considering a lack of background and laboratory confirmation results.

- It was not apparent why certain samples were selected for laboratory confirmation and others were not. There was no apparent consistency in the selection of samples for laboratory confirmation.

- Samples were submitted for confirmation laboratory analyses three months or more following the collection of the samples in the field. No information was provided regarding the custody and/or storage of the samples. The samples were submitted to the analytical laboratory with incomplete chain-of-custody (COC), and the COC documentation was not completed by the laboratory.

In summary, the data from the study do not provide the basis for meaningful interpretation. Any attempt to formulate conclusions from the data as presented regarding the presence of preferred or predominant groundwater flow patterns is not warranted or recommended.

3.3 HWMU-16 GROUNDWATER MONITORING ANALYTE LIST

The groundwater monitoring analyte list for HWMU-16 is presented in **Table 1 (Appendix B)**. The list represents the subset of the constituents listed in Appendix III of 40 CFR Part 261 that previously have been detected in the groundwater and/or that are reasonably expected to be in or derived from waste contained in HWMU-16. As discussed in Section 3.5.2 below, 12 inorganic constituents and two explosive/propellant constituents have been detected in the groundwater monitoring network for HWMU-16 at statistically significant concentrations above the Unit's calculated background concentrations. The inorganic constituents may be derived from the aquifer formation materials; however, the two explosive/propellant constituents (2,4-Dinitrotoluene and 2,6-Dinitrotoluene) are byproducts of wastes derived from explosives. Therefore, the two explosive/propellant constituents detected could only be from HWMU-16.

The concentration limits established for the hazardous constituents also are listed in **Table 1**. The concentration limits represent either background concentrations calculated for the constituents in this GWQAR, Maximum Concentrations of Constituents for Ground-water Protection listed in Table 1 of 40 CFR 264.94, USEPA Drinking Water Standard Maximum Contaminant Levels (MCLs), or alternate concentration limits (ACLs) established by the VDEQ (July 1998). Certain organic constituents on the list do not have USEPA MCLs or VDEQ ACLs; they also do not have calculated background concentrations because they have not been detected in the Unit's upgradient well. Therefore, the concentration limits for these constituents are equal to their respective method detection limits.

As Alliant discussed with the VDEQ in the past, the reliability of previous laboratory analytical data - particularly dissolved metals data - appeared to be questionable in some cases. In an April 9, 1996 letter to C. Jake (Alliant), the VDEQ agreed that only total metals concentrations in groundwater would be measured, as described in a USEPA Region III guidance on groundwater sampling in karst terrain. Therefore, all references to metals concentrations in this GWQAR refer to <u>total</u> metals concentrations.

3.4 HWMU-16 GROUNDWATER BACKGROUND CONCENTRATIONS

Background concentrations were calculated for each constituent in the groundwater monitoring program using the analytical data from 1996 through 1998 for upgradient well 16C1.

The background concentration calculations were based on site wide 95% confidence, 95% coverage upper prediction intervals. The calculated background concentrations are listed in **Table 2 (Appendix B)**. The background concentrations were used to construct the outermost closing contours on the Isoconcentration Maps **(Appendix A)**.

3.5 HWMU-16 STATISTICAL ANALYSIS

Statistical evaluations for HWMU-16 are performed annually and submitted to the VDEQ in accordance with the annual reporting requirements specified in 40 CFR 265.94. As part of this GWQAR, statistical evaluations were performed on Fourth Quarter 1998 analytical data in accordance with the procedures and guidance provided in the following documents:

- Title 40 of the Code of Federal Regulations, 40 CFR 264.97 and 264.98;
- VDEQ Guidance for statistical analysis titled "Data Analysis Plan," undated;
- Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, April 1989;
- Addendum to Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, USEPA, July 1992; and
- Statistical Methods for Groundwater Monitoring, Gibbons, R.D., 1994.

Statistical threshold values were computed for the 54 constituents for which HWMU-16 is currently monitored based on the concentrations of those constituents in upgradient (background) well 16C1. All data starting with First Quarter 1996 to Fourth Quarter 1998 were used for this purpose. The 1996 through 1998 monitoring data have been submitted previously to the VDEQ by Alliant in quarterly monitoring reports; therefore, the data are not listed in this GWQAR. Statistical comparisons were performed for the Fourth Quarter 1998 data set. Comparison statistical analyses were performed for all constituents which were detected in any downgradient well during that event.

3.5.1 Background Data and Statistical Comparisons

Statistical analyses were performed using the analytical results from upgradient well 16C1 data as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical comparisons varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in **Appendix C**.

The constituents listed below were 100% non-detected in the background data. The background threshold levels (BTLs) for these constituents were established as equal to their detection limits (DL). Detections of these constituents in the downgradient wells during Fourth Quarter 1998 were compared to these BTLs.

Background Threshold Level (BTL) = Detection Limit (DL)				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Antimony	12	100	3	3
Arsenic	12	100	1	1
Bromoform	12	100	0.3	0.3
Carbon tetrachloride	12	100	0.2	0.2
Chlorobenzene	12	100	0.1	0.1
Chloromethane	12	100	0.3	0.3
Cyanide	12	100	10	10

Background Threshold Level (BTL) = Detection Limit (DL)				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Di-n-butyl phthalate	12	100	5	5
1,2-Dichloroethane	12	100	0.1	0.1
trans-1,2-Dichloroethene	12	100	0.1	0.1
1,4-Dichlorobenzene	12	100	0.1	0.1
Ethylbenzene	12	100	0.1	0.1
Mercury	12	100	0.2	0.2
Methyl ethyl ketone	12	100	1.1	1.1
Selenium	12	100	1	1
1,1,2,2-Tetrachloroethane	12	100	0.3	0.3
1,1,2-Trichloroethane	12	100	0.5	0.5
Trichloroethene	12	100	0.1	0.1
Toluene	12	100	0.1	0.1
2378-TCDF	12	100	0.0485 ppt	0.0485 ppt
12378-PECDF	12	100	0.0439 ppt	0.0439 ppt
23478-PECDF	12	100	0.0417 ppt	0.0417 ppt
123478-HXCDF	12	100	0.0390 ppt	0.0390 ppt
123678-HXCDF	12	100	0.0377 ppt	0.0377 ppt
234678-HXCDF	12	100	0.0428 ppt	0.0428 ppt
123789-HXCDF	12	100	0.0415 ppt	0.0415 ppt
1234678-HPCDF	12	100	0.0615 ppt	0.0615 ppt
1234789-HPCDF	12	100	0.0709 ppt	0.0709 ppt
OCDF	12	100	0.1307 ppt	0.1307 ppt

Non-parametric prediction intervals were computed for all of the constituents for which the data from background well 16C1 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background threshold levels for these constituents were set as equal to their upper prediction limits (UPLs). The background and relevant statistical data for these constituents are summarized below. The confidence level and false positive rate were calculated based on the number of background data points available and number of future comparisons. For all constituents, the confidence level was determined to be equal to 0.933, and the false positive rate was equal to 0.067. Since the upper control limit of a non-parametric interval cannot be adjusted for multiple comparisons and inadequate number of background data, the number of resampling events required was adjusted to account for the high error rates inherent in those situations. The number of confirmation resamples required for all constituents is 2. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in **Appendix C**.

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Beryllium	12	75	0.2	0.7
Cadmium	12	75	0.1	0.2
Cobalt	12	75	1	5
Copper	12	50	1	13
1,1-Dichloroethane	12	0	0.2	9.5
2,4-Dinitrotoluene	12	92	0.08	0.10

BTL = Upper Prediction Limit of Non-parametric Prediction Interval w/false positive rate=0.067				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
2,6-Dinitrotoluene	12	75	0.08	0.11
Lead	12	42	1	10
Nickel	12	92	15	16
Silver	12	75	0.2	0.5
Thallium	12	67	1	6
TOC	12	75	1000	7000
1,1,1-Trichloroethane	12	17	0.3	9.2
Vanadium	12	83	4	151
Vinyl Chloride	12	92	0.1	0.1
Xylene (total)	12	92	0.1	0.2
Zinc	12	50	5	51

Chromium exhibited normally distributed data (excluding non-detects) with between 25% and 50% non-detects in the background well. The mean and standard deviation of the background data for chromium were adjusted using Cohen's Maximum Likelihood Estimator Method (1959, 1961). A one-sided parametric prediction interval was then computed for chromium based on the adjusted mean and standard deviation. The Upper Prediction Limit was set as the BTL for chromium. The background and relevant statistical data for chromium are summarized below. Cohen's adjustment computations and prediction interval computations are presented in **Appendix C**.

BTL = Upper Prediction Limit of Prediction Interval w/false positive rate=0.05 Original Mean = 3.54, Original SD = 1.933 Adjusted Mean = 3.642. Adjusted SD = 1.95				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Chromium	12	25	1	6.2

The following constituents exhibited normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for all of these constituents. The UPLs for these constituents were set as their respective BTLs, with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the BTL for pH consisted of a range between the lower prediction limit (LPL) and the upper prediction limit. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the minimum required false positive rate was below 1% (0.01). A 99% confidence level (0.01 false positive rate) was used for all individual comparisons, which with the most conservative assumptions provided a site-wide false positive rate of >0.05 for all constituents. The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in **Appendix C**.

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL – UPL of two-sided Prediction Interval				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Barium	12	0	2	175.4
Dichlorodifluoromethane	12	8	0.3	46.5
Tetrachloroethene	12	17	0.1	0.7
TOX	12	17	5	42.2

BTL = UPL of one-sided Prediction Interval (exception pH) w/site-wide false positive rate>0.05 (individual comparisons false positive rate=0.01) BTL for pH = LPL – UPL of two-sided Prediction Interval				
Parameter	Sample Size	% Non-Detects	DL (µg/l)	BTL (µg/l)
Trichlorofluoromethane	12	0	0.5	11.3
Specific Conductivity	8	0	1 µS/cm	672 µS/cm
pH	8	0	0.1 pH units	5.7 to 7.9 pH units

3.5.2 Results of Statistical Comparisons

The following table lists the constituents which were detected during the Fourth Quarter 1998 event at concentrations exceeding their respective background threshold levels (BTLs), and the downgradient wells in which they were detected.

Parameter	Monitoring Well(s)
Arsenic	16-5, 16WC2B
Barium	16-2, 16-3, 16-5, 16WC1A, 16WC1B, 16WC2B, 16SPRING
Beryllium	16WC1B, 16WC2B
Cadmium	16WC1B
Chromium	16-3, 16-5, 16WC1B, 16WC2B
Cobalt	16-5, 16WC1B, 16WC2B
Copper	16-5, 16WC1B, 16WC2B
Lead	16WC1B
Mercury	16WC1B
Nickel	16-5, 16WC1A, 16WC2B
Selenium	16-5, 16WC1B, 16WC2B
Zinc	16WC1B
2,4-Dinitrotoluene	16-3, 16-5, 16WC1B, 16WC2B, 16SPRING
2,6-Dinitrotoluene	16WC1A, 16WC1B

Any HWMU-16 target constituents not listed above were not detected in the downgradient monitoring wells at concentrations exceeding their respective BTLs.

3.6 HWMU-16 PLUME DELINEATIONS

In accordance with VDEQ instructions presented during the May 19, 1999 meeting between Alliant and the VDEQ, Isoconcentration Maps were produced to depict constituent plumes in the groundwater beneath the site (**Appendix A**). In order to evaluate the shape and position of constituent plumes over time, historical Isoconcentration Maps were developed using the historical maximum concentrations for the constituents monitored at the site for the time periods of 1992 through 1995 and 1996 through 1998. The historical maximum concentrations for these time periods are listed in **Tables 3** and **4**, respectively (**Appendix B**).

Groundwater analytical data collected prior to 1992 were not included in the evaluation of historical maximum concentrations. The data collected prior to 1992 are considered unreliable due to "order-of-magnitude" variations in parameter concentrations from quarter to quarter, as well as a general lack of laboratory QA/QC. Additionally, the groundwater monitoring analyte lists prior to 1992 did not include many of the parameters on the current groundwater monitoring analyte list for HWMU-16.

TABLE 2
HWMU-16
Calculated Background Values

Constituent	Background Concentration (µg/l unless otherwise noted)
Antimony	3
Arsenic	1
Barium	175.4
Beryllium	0.7
Cadmium	0.2
Chromium	6.2
Cobalt	5
Copper	13
Lead	10
Mercury	0.2
Nickel	16
Selenium	1
Silver	0.5
Thallium	6
Vanadium	151
Zinc	51
Bromoform	0.3
Carbon Tetrachloride	0.2
Chlorobenzene	0.1
Chloromethane	0.3
1,4-Dichlorobenzene	0.1
Dichlorodifluoromethane	46.5
1,1-Dichloroethane	9.5
1,2-Dichloroethane	0.1
trans-1,2-Dichloroethene	0.1
Ethylbenzene	0.1
Methyl Ethyl Ketone	1.1
1,1,2,2-Tetrachloroethane	0.3
Tetrachloroethene	0.7
Toluene	0.1
1,1,1-Trichloroethane	9.2
1,1,2-Trichloroethane	0.5
Trichloroethene	0.1
Trichlorofluoromethane	11.3
Vinyl Chloride	0.1
Xylenes (total)	0.2

TABLE 2
HWMU-16
Calculated Background Values

Constituent	Background Concentration (µg/l unless otherwise noted)
Di-n-butylphthalate	5
2,4-Dinitrotoluene	0.10
2,6-Dinitrotoluene	0.11
2378-TCDF	0.0485 ppt
12378-PECDF	0.0439 ppt
23478-PECDF	0.0417 ppt
123478-HXCDF	0.0390 ppt
123678-HXCDF	0.0377 ppt
234678-HXCDF	0.0428 ppt
123789-HXCDF	0.0415 ppt
1234678-HPCDF	0.0615 ppt
1234789-HPCDF	0.0709 ppt
OCDF	0.1307 ppt
Cyanide	10
Total Organic Carbon (x4)	7000
Total Organic Halides (x4)	42.2
Specific Conductivity	672 µS/cm
pH	5.7 to 7.9 pH units

Appendix IX Constituents Detected Since Permit Issuance
HWMUs 5, 7, 10, and 16
Radford Army Ammunition Plant

Unit	Quarter Initially Detected	Constituent	Background--Calculated or QL?	Background (ug/L)	GPS Required? (261 Appendix VIII)	Proposed GPS (ug/L)	Source
HMWU-5	Fourth Quarter 2003	Chromium	QL	5	yes	100	USEPA MCL
		Diethyl Ether	QL	12	no	NA	NA
		2-Nitroaniline	QL	20	no	NA	NA
		4-Nitroaniline	QL	20	yes	20	Background/QL
		Nitrobenzene	QL	10	yes	10	Background/QL
	Third Quarter 2006	Dichlorodifluoromethane	QL	1	yes	125.2	VDEQ ACL
HWMU-7	Third Quarter 2003	Copper	Calculated	49	no	NA	NA
	Second Quarter 2004	Zinc	Calculated	217	no	NA	NA
HWMU-10	First Quarter 2003	Cobalt	QL	5	no	NA	NA
	Second Quarter 2003	Vanadium	QL	10	no	NA	NA
	Second Quarter 2005	Acetone	QL	10	no	NA	NA
		2-Propanol	QL	50	no	NA	NA
HWMU-16	Second Quarter 2003	Chloroethane	Calculated	20.7	yes	20.7	Background/QL
		Diethyl Ether	Calculated	75.5	no	NA	NA
		Dimethyl Ether	Calculated	17.0	no	NA	NA
	Third Quarter 2003	Methylene Chloride	Calculated	13.95	no*	NA	NA
	Second Quarter 2004	1,1,2-Trichloro-1,2,2-trifluoroethane	Calculated	1.2	no*	NA	NA

HWMU-5: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.1.g.), GPS are proposed for those additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chromium, 4-nitroaniline, nitrobenzene, and dichlorodifluoromethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and 2-nitroaniline).

HWMU-7: Background concentrations for the additional Appendix IX constituents detected in the downgradient point of compliance wells (copper and zinc) were previously calculated and submitted to the VDEQ in the August 1998 ***Groundwater Quality Assessment Report for HWMU-7*** prepared by ERM, Inc. In accordance with the Permit (Condition V.J.2.g.), no GPS are proposed for the additional Appendix IX constituents (copper and zinc), as they are not listed in Appendix VIII of 40 CFR Part 261.

HWMU-10: The additional Appendix IX constituents detected in the downgradient point of compliance wells were not detected above their respective Quantitation Limits (QLs) in the upgradient well. As a result, background concentrations for those constituents were set as equal to their respective QLs. In accordance with the Permit (Condition V.J.3.g.), no GPS are proposed for the additional Appendix IX constituents (cobalt, vanadium, acetone, and 2-propanol), as they are not listed in Appendix VIII of 40 CFR Part 261.

HWMU-16: Background concentrations for additional Appendix IX constituents chloroethane, diethyl ether, dimethyl ether, and methylene chloride were calculated using data collected from upgradient well 16C1 during the period from Third Quarter 2003 through Third Quarter 2004. The background concentration for additional Appendix IX constituent 1,1,2-trichloro-1,2,2-trifluoroethane was calculated using data collected from upgradient well 16C1 during the period from Second Quarter 2004 through Third Quarter 2006.
In accordance with the Permit (Condition V.J.4.g.), GPS are proposed for additional Appendix IX constituents that are listed in Appendix VIII of 40 CFR Part 261 (chloroethane). No GPS are proposed for the additional Appendix IX constituents that are not listed in Appendix VIII of 40 CFR Part 261 (diethyl ether and dimethyl ether).
*Methylene chloride and 1,1,2-trichloro-1,2,2-trifluoroethane should not be added to the Groundwater Monitoring List for HWMU-16, as these constituents were only detected in the upgradient well for the Unit, and not in the downgradient point of compliance wells.

Statistical Computations – RAAP HWMU-16 – 1,1,2-Trichloro-1,2,2-Trifluoroethane

In accordance with the facility permit and VHWMR, statistical background concentration is being established for 1,1,1-Trichloro-1,2,2-Trifluoroethane. Inter-well upper prediction limits (UPL) were calculated on the background data for this target parameter in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for this target parameter consisted of all data for the background well 16C1 collected from 2nd quarter 2004 through 3rd quarter 2006.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations are tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data set was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). Results of the normality tests show that the background data for 1,1,2-Trichloro-1,2,2-Trifluoroethane is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for this parameter. The confidence levels of NUPLs are typically approximate and estimated to be around 91%.

Summary of UPL

Parameter	Background Data Distribution	Type of UPL	Multiple Comparisons/year	UPL (µg/l)
1,1,2-Trichloro-1,2,2-Trifluoroethane	Non-Normal	NUPL	N/A	1.2

Statistical Computations – RAAP HWMU-16

In accordance with the facility permit and VHWMR, statistical background concentrations are being established for the four new target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride. These four target parameters were added to the facility monitoring program during the 3rd quarter 2003 monitoring event. Inter-well upper prediction limits (UPL) were calculated on the background data for the target parameters in accordance with the facility permit and VHWMR (40 CFR 264.97(h)). Background data for these target parameters consisted of all data for the background well 16C1 collected from 3rd quarter 2003 through 3rd quarter 2004.

Discussion of Tests for Normality

The power of a statistical tool to account for false positive and false negative results, while accurately detecting true statistical variations for a facility under scrutiny depends on numerous factors, one of which is the distribution of the data. A great number of statistical tools are based on the assumption that data are normally distributed. Hence the distribution of the sample population for parameters evaluated under this statistical analysis is first determined. Sample populations were tested for normal distribution using several normality tests. "Groundwater Information Tracking System with Statistical Analysis Capability" (GRITS/STAT) v5.0 was the software used to run these statistical tests. GRITS/STAT is an analytical software package provided by the USEPA. The distributions of the data sets were verified in the original mode as well as in log-transformed mode. The normality of the data sets was evaluated using the Shapiro-Wilk test for normality.

Discussion of Prediction Interval Tests

Normality tests are performed prior to running parametric tests (tests that require that the data be normal). A 99% confidence parametric inter-well UPL was computed for each of the four target parameters that showed normally distributed background data. Results of the normality tests show that the background data for chloroethane, diethyl ether and methylene chloride are normally distributed, and the background data for dimethyl ether is non-normally distributed. Non-parametric UPL (NUPL) was constructed on the background data for dimethyl ether, and parametric UPLs (PUPL) were constructed on the background data for chloroethane, diethyl ether and methylene chloride. No adjustments to the error rates were made to the NUPLs for multiple comparisons. Adjustment for 10 comparisons per year (considering 10 compliance monitoring wells at the facility and 4 quarters of data for each year, and considering historic detects, 10 is considered a representative number for multiple comparisons per year) was made to the PUPLs. The confidence levels of NUPLs are well less than 95%. Any statistically significant increase (SSI) must be confirmed by verification sampling.

Summary of UPLs

Parameter	Background Data Distribution	Type of UPL	Multiple Comparisons/year	UPL (µg/l)
Chloroethane	Normal	PUPL	10	20.7
Diethyl ether	Normal	NUPL	10	75.5
Dimethyl ether	Non-normal	PUPL	N/A	17.0
Methylene Chloride	Normal	PUPL	10	13.95

RAAP-HWMU-16 - Statistical Analysis - Notes

1) Y2K Correction dates are as shown in table below.

Actual Event	Date Used in Stat Software
2000-Qtr1	12/13/1999
2000-Qtr2	12/14/1999
2000-Qtr3	12/15/1999
2000-Qtr4	12/16/1999
2001-Qtr1	12/17/1999
2003-Qtr3	12/18/1999
2003-Qtr4	12/19/1999
2004-Qtr1	12/20/1999
2004-Qtr2	12/21/1999
2004-Qtr3	12/22/1999

Interwell Tests:
2) Background data for target parameters chloroethane, diethyl ether, dimethyl ether and methylene chloride were evaluated using Shapiro-Wilk test. Background data showed normal distribution for chloroethane, diethyl ether and methylene chloride. Parametric interwell 99% confidence upper prediction limits were computed for parameters with normally distributed background data. Dimethyl ether background data was non-normally distributed. Therefore non-parametric Upper Prediction Limit (UPL) was computed for dimethyl ether.

3) No adjustments for multiple comparisons could be made for non-parametric UPLs. Adjustments were made to the parametric UPLs for 10 future comparisons per year to account for multiple compliance monitoring wells and quarterly event data.
Any Statistically significant increase (SSI) must be confirmed by verification sampling.

E:\Ross Work\Radford AAP Archives\HWMU-16\[HWMU16StatDate correction.xls]Sheet1

Normality Tests

Report Printed: 02-02-2005 13:49

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ClEthane Chloroethane

CAS Number: 75-00-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1.000	6.400	4.340	2.078
Log:	0.000	1.856	1.303	0.749

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	4.340	1.303
Std Dev:	2.078	0.749
Skewness:	-0.810	-1.296*
Kurtosis:	-0.555	-0.011
Minimum:	1.000	0.000
Maximum:	6.400	1.856
CV:	0.479	0.575

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9037	0.7620	0.6860

Log:	0.7615*	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Chloroethane(CAS Number:75-00-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.9037
Critical W, α=0.01:	0.6860
Mean:	4.340 ppb
Std Dev:	2.078 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[1-\frac{\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	20.669 ppb
LL:	-∞

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 02-02-2005 13:49

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DEthEth Diethyl ether

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 24.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	12.000	30.000	21.200	6.907
Log:	2.485	3.401	3.007	0.355

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	21.200	3.007
Std Dev:	6.907	0.355
Skewness:	-0.122	-0.491
Kurtosis:	-1.140	-1.024
Minimum:	12.000	2.485
Maximum:	30.000	3.401
CV:	0.326	0.118

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9768	0.7620	0.6860

Log:	0.9507	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Diethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.9768
Critical W, α=0.01:	0.6860
Mean:	21.200 ppb
Std Dev:	6.907 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[1-\frac{\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	75.470 ppb
LL:	-∞

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 02-02-2005 13:53

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DMethEth Dimethyl ether

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 24.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	12.000	17.000	13.000	2.236
Log:	2.485	2.833	2.555	0.156

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	13.000	2.555
Std Dev:	2.236	0.156
Skewness:	1.500*	1.500*
Kurtosis:	0.250	0.250
Minimum:	12.000	2.485
Maximum:	17.000	2.833
CV:	0.172	0.061

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.5521*	0.7620	0.6860

Log:	0.5521*	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Dimethyl ether(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Conf. Level (1-α):	33.330%

UL: 17.000 ppb
LL: 0.000

Normality Tests

Report Printed: 02-02-2005 13:54

Facility:RAAPHWMU16 Haz. Waste Unit 16 - RAAP

Address:

City:Radford ST:VA Zip:24141
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:MeCl Dichloromethane (Methylene chloride)

CAS Number: 75-09-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Mar 31 1996
End Date:Dec 22 1999

Normality Test on Observations for wells listed below:

Well:16C1 Position:Upgradient Observations:5

Scale	Minimum	Maximum	Mean	Std Dev
Original:	4.100	6.800	5.800	1.037
Log:	1.411	1.917	1.743	0.197

Pooled Statistics
Observations: 5

Statistic	Original Scale	Log Scale
Mean:	5.800	1.743
Std Dev:	1.037	0.197
Skewness:	-0.925	-1.088*
Kurtosis:	-0.436	-0.263
Minimum:	4.100	1.411
Maximum:	6.800	1.917
CV:	0.179	0.113

Shapiro-Wilk Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.8964	0.7620	0.6860

Log:	0.8519	0.7620	0.6860

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed February 2,2005

Facility:Haz. Waste Unit 16 - RAAP
Parameter:Dichloromethane (Methylene chloride(CAS Number:75-09-2)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	5
Shapiro-Wilk (W):	0.8964
Critical W,α=0.01:	0.6860
Mean:	5.800 ppb
Std Dev:	1.037 ppb
DF:	4
Conf. Level (1-α):	~~0.9500~~ 0.99
Future Samples (k):	10
$t_{\left[1-\frac{\alpha}{k}\right]}$:	7.1732
Kappa:	7.8579
UL:	13.947 ppb
LL:	-∞

Report Produced by GRITS/STAT 5.01

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia
Upgradient well = 16C1

All Results in ug/L.

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Chloroethane					*CAS #*	*75-00-3*		
Third Quarter 2003	6.4	U	4.8	U	U	1	20.7	8260B
Fourth Quarter 2003	5.7	U	2.6	1.1	U	1	20.7	8260B
First Quarter 2004	U J	U J	U J	U J	U J	1	20.7	8260B
Second Quarter 2004	4.4	U	2.4	0.63 J	U	1	20.7	8260B
Third Quarter 2004	4.2	U	2	U	U	1	20.7	8260B
Fourth Quarter 2004	4.9	U	2.5	U	U	1	20.7	8260B
First Quarter 2005	7.6 J	U J	3.7 J	U J	U J	1	20.7	8260B
Second Quarter 2005	U J	U	U J	U	U	1	20.7	8260B
Third Quarter 2005	4.7 J	U J	U	U J	U J	1	20.7	8260B
Fourth Quarter 2005	4.6 J	U	2.6 J	U	U	1	20.7	8260B
First Quarter 2006	5.3	U	U	U	U	1	20.7	8260B
Second Quarter 2006	5 J	U	2 J	U	U	1	20.7	8260B
Third Quarter 2006	5	U	0.7 J	0.7 J	U	1	20.7	8260B
Fourth Quarter 2006	5.8	U	1	U	U	1	20.7	8260B
First Quarter 2007	6.1	U	1	U	U	1	20.7	8260B
Second Quarter 2007	5.2	U	1.4	U	U	1	20.7	8260B
Diethyl ether					*CAS #*	*60-29-7*		
Third Quarter 2003	12 J	U	12 J	U	U	12	-	8260B
Fourth Quarter 2003	30	U	14	U	U	12	-	8260B
First Quarter 2004	24	U	U	U	U	12	-	8260B
Second Quarter 2004	23 J	U J	13 J	U J	U J	12	-	8260B
Third Quarter 2004	17	U	U	U	U	12	-	8260B
Fourth Quarter 2004	24	U J	U	U	U J	12	-	8260B
First Quarter 2005	29	U	14	U	U	12	-	8260B
Second Quarter 2005	20	U J	9.2	U J	U J	12	-	8260B
Third Quarter 2005	30	U	15	U	U	12	-	8260B
Fourth Quarter 2005	25	U	18	U	U	12	-	8260B
First Quarter 2006	19	U	U	U	U	12	-	8260B
Second Quarter 2006	17	U	U	U	U	12.5	-	8260B
Third Quarter 2006	33	1.5 J	4.3 J	4.6 J	U	12.5	-	8260B
Fourth Quarter 2006	20	U	U	U	U	12.5	-	8260B
First Quarter 2007	21	U	U	U	U	12.5	-	8260B
Second Quarter 2007	17 J	1.5 J	5.7 J	2.1 J	U J	12.5	-	8260B
Dimethyl ether					*CAS #*	*115-10-6*		
Third Quarter 2003	6.6 J	U	9.9 J	U	U	12	-	8260B
Fourth Quarter 2003	U	U	U	U	U	12	-	8260B
First Quarter 2004	17 J	U J	13 J	U J	U J	12	-	8260B
Second Quarter 2004	U J	U J	6.6 J	U J	U J	12	-	8260B
Third Quarter 2004	U J	U J	U J	U J	U J	12	-	8260B
Fourth Quarter 2004	16 J	U J	12 J	U	U J	12	-	8260B
First Quarter 2005	26	U	25	U	U	12	-	8260B
Second Quarter 2005	15	U	14	U	U	12	-	8260B
Third Quarter 2005	13	U	U	U	U	12	-	8260B
Fourth Quarter 2005	U	U	U	U	U	12	-	8260B
First Quarter 2006	U	U	U	U	U	12	-	8260B
Second Quarter 2006	U	U	U	U	U	12.5	-	8260B
Third Quarter 2006	11 J	U J	3.2 J	2.8 J	U J	12.5	-	8260B
Fourth Quarter 2006	U	U	U	U	U	12.5	-	8260B
First Quarter 2007	U	U	U	U	U	12.5	-	8260B
Second Quarter 2007	11 J	U	7 J	2.6 J	1.2 J	12.5	-	8260B

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 *All Results in ug/L.*

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*
Methylene chloride					*CAS #* 75-09-2			
Third Quarter 2003	4.1	U	U	U	U	1	13.95	8260B
Fourth Quarter 2003	6.8	U	U	U	U	1	13.95	8260B
First Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
Second Quarter 2004	5.7	U	U	U	U	1	13.95	8260B
Third Quarter 2004	6	U A	U A	U A	U A	1	13.95	8260B
Fourth Quarter 2004	6.4	U	U	U	U	1	13.95	8260B
First Quarter 2005	6.8 J	U	U	U	U	1	13.95	8260B
Second Quarter 2005	6.3	U	U	U	U	1	13.95	8260B
Third Quarter 2005	6.2	U	U	U	U	1	13.95	8260B
Fourth Quarter 2005	4.7	U	U	U	U	1	13.95	8260B
First Quarter 2006	4.9	U	U	U	U	1	13.95	8260B
Second Quarter 2006	7	U	U	U	U	1	13.95	8260B
Third Quarter 2006	U N	U N	U N	U N	U N	1	13.95	8260B
Fourth Quarter 2006	U A	U	U	U A	U	1	13.95	8260B
First Quarter 2007	6.3	U	U	U	U	1	13.95	8260B
Second Quarter 2007	3.4	U	U	U	U	1	13.95	8260B
1,1,2-Trichloro-1,2,2-Trifluoroethane					*CAS #* 76-13-1			
Third Quarter 2003	U	U	U	U	U	1	-	8260B
Second Quarter 2004	1.2	U J	U J	U J	U J	1	-	8260B
Third Quarter 2004	U	U	U	U	U	1	-	8260B
Fourth Quarter 2004	U	U	U	U	U	1	-	8260B
First Quarter 2005	1	U	U	U	U	1	-	8260B
Second Quarter 2005	U	U	U	U	U	1	-	8260B
Third Quarter 2005	U	U	U	U	U	1	-	8260B
Fourth Quarter 2005	U	U	U	U	U	1	-	8260B
First Quarter 2006	U	U	U	U	U	1	-	8260B
Second Quarter 2006	U	U	U	U	U	1	-	8260B
Third Quarter 2006	U	U	U	U	U	1	-	8260B
Fourth Quarter 2006	U	U	U	U	U	1	-	8260B
First Quarter 2007	U	U	U	U	U	1	-	8260B
Second Quarter 2007	U	U	U	U	U	1	-	8260B

See last page of this report for definitions.

Target Analyte Monitoring Results - HWMU-16 Point of Compliance Wells
Radford Army Ammunition Plant, Radford, Virginia

Upgradient well = 16C1 *All Results in ug/L.*

Analtye/Quarter	*16C1*	*16MW8*	*16MW9*	*16WC1A*	*16WC1B*	*QL*	*GPS*	*Method*

Definitions: **QL** Denotes permit required quantitation limit. **U** Denotes analyte not detected at or above QL. **UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes associated result is estimated. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated. **UN** Denotes analyte concentration is less than the quantiation limit and five times the blank concentration. Not reliably detected due to blank contamination. This qualifier used only for Appendix IX monitoring event when results are reported to at or above the project detection limit. **R** Denotes result rejected. **Q** Denotes data validation qualifier. **CAS#** Denotes Chemical Abstract Services registration number. **X** Denotes mass spectral confirmation not obtained-result suspect.

GPS Denotes Groundwater Protection Standards listed in Appendix G to Attachment 5 in the Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Units 5, 7, 10, and 16 (October 4, 2002).
NS denotes not sampled. **NA** denotes not analyzed. "–" denotes not detected (pre-2nd Quarter 2003) or not available / not sampled (beginning 2nd Quarter 2003).

Notes:
-Appendix IX Groundwater Monitoring Events:
Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007
For Appendix IX monitoring events, all results evaluated to detection limit. See laboratory data deliverable for detection limit.

-9/30/2003: Verification sampling event for 16C1 (heptachlor) and 16C1B (Endrin). Verification results: all results reported not detected to detection limit. Original results 0.067 µg/l and 0.39 µg/l, respectively. Confirmation results reported in this table.
-9/30/2003: Verification sampling event for 16C1 (chloroethane, ethyl ether, methyl ether, methylene chloride) and 16MW9 (chloroethane, ethyl ether, methyl ether). Verification results: all results confirmed original analysis. Original results reported in this table.
-June 21, 2004: Verification event for 8260B 16C1 (1,1-dichloroethene and 1,1,2-trichloro-1,2,2-trifluoroethane). Verification results: all not detected except 1,1,2-trichloro-1,2,2-trifluoroethane added to quarterly analyte list beginning 3Q 2004. Due to laboratory error, Appendix IX results for semivolatiles (Method 8270C) will be presented in 3Q 2004. Verification event results for 16WC1B and 16C1 (8081A) – all verification results were not confirmed.
-07/27-28/2005. Verification event for 16WC1B (Mercury Method 7470A.) Not detected in verification sample. Also, verification event for 16C1, 16WC1B-8081A. and 16C1, 16MW9, 16WC1A-ethanol. All verification results not detected. Verification results used.
-06/19/2007. Verification event for 16WC1B and 16MW9 thallium Not detected in verification sample. Verification results used.

Ross Miller

From: Flint, Jeremy <Jeremy.Flint@ATK.COM>
Sent: Friday, January 20, 2012 2:23 PM
To: Powers, Loretta
Cc: Janet Frazier; Kathy Olsen; Mike Lawless; Ross Miller
Subject: FW: VA1210020730, RAAP, Additional App. IX GW Mont Results PCC HWMU 5,7,10,16, Final Notification

Loretta,
Please file the attached e-mail as an answer to ATK letter number 11-815-106

Thank You
Jeremy Flint
Lead Compliance Engineer
Environmental Affairs Department
Alliant Techsystems Inc.
P.O. Box 1
Radford, VA 24143
Phone: 540 - 639 - 7668
Fax: 540 - 639 - 8109
"Together Everyone Accomplishes More." (TEAM)

From: Maiden, Vince (DEQ) [mailto:Vincent.Maiden@deq.virginia.gov]
Sent: Friday, January 20, 2012 10:26 AM
To: Flint, Jeremy
Cc: McKenna, Jim; Schneider, Jutta (DEQ)
Subject: VA1210020730, RAAP, Additional App. IX GW Mont Results PCC HWMU 5,7,10,16, Final Notification

Jeremy:

The Department has received the referenced August 1, 2011 document. The notification indicates the benzene was confirmed in 16MW and recommended that this contituent be added to the compliance monitoring list for HWMU-16. In addition, the facility recommeded that the background for benzene be estalished at the LOQ of 1µg/l and the groundwater protection standard be set at 5µg/l based on the MCL. The Department agrees with the recommedations. It appears that these changes were included in the permit renewal application dated September 15, 2011. The Department will formally address those changes along with others in the permit renewal process. If you have any questions please feel free to contact me.

Vincent Maiden
Corrective Action Project Manager
Virginia Department of Environmental Quality
Office of Remediation Programs
629 East Main Street or P.O. Box 1105
Richmond, VA 23218 Richmond, VA 23219
(276) 676-4867
Vincent.Maiden@deq.virginia.gov

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

Office of Waste Permitting and Compliance

Land Protection and Remediation Division

September 12, 2014

VIA ELECTRONIC MAIL
Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems, Inc.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford, Virginia 24141

Re: Radford Army Ammunition Plant, Radford, VA
EPA ID No.VA1210020730, Approval of Class 1 Permit Modifications
Hazardous Waste Management Units 5 and 16, Post Closure-Care Permit

Dear Mr. Stewart:

Enclosed are the final Class 1 Modifications to the Hazardous Waste Permit for Post Closure-Care of two hazardous waste management units (HWMUs) 5 and 16 at the Radford Army Ammunition Plant (RAAP), Radford, Virginia facility. The final Class 1 Modifications to the Permit have been approved.

The Virginia Department of Environmental Quality (DEQ) received the Class 1 Permit groundwater related modification request addressing the HWMU 16 that was communicated to the DEQ in an e-mail dated August 13, 2014, from the RAAP, Radford, Virginia facility. RAAP requested that 1,1-dichloroethene (1,1-DCE) be added to the Groundwater Compliance Monitoring Constituent List for HWMU-16.

1,1-DCE was detected in the most recent annual groundwater sampling event required under the Post-Closure Permit, and in a letter dated July 21, 2014, the VDEQ supported the RAAP's July 1, 2014, proposal that 1,1-DCE be added to the Groundwater Compliance Monitoring Constituent List and also the setting of the background value for 1,1-DCE at the Limit of Quantitation (LOQ) value of 1

ug/1 and the Groundwater Protection Standard (GPS) at the USEPA Maximum Contaminant Level (MCL) of 7 ug/l.

In the e-mail letter dated August 13, 2014, RAAP submitted the following requested changes to the facility's hazardous waste Post Closure-Care Permit as marked–up files comprising the Class 1 Permit modification:

- Permit Attachment 3, Appendix E (HWMU-16 Groundwater Compliance Monitoring Constituent List) from the Post-Closure Care Permit to add 1,1-DCE to the groundwater Compliance Monitoring Program for HWMU-16, and

- Permit Attachment 3, Appendix G (HWMU-16 Groundwater Protection Standards) from the Post-Closure Care Permit to add 1,1-DCE to the groundwater Compliance Monitoring Program for HWMU-16.

The requested changes represent a Class 1 permit modification under 40 CFR § 270.42, Appendix I.C.2 – *Changes in groundwater sampling or analysis procedures or monitoring schedule, with prior approval of the Director.*

Based on the above justification, this August 13, 2014, e-mailed letter requesting changes in the groundwater compliance monitoring program including the addition of 1,1-DCE and its associated background concentration and GPS; the RAAP has established sufficient documentation for approval of all requested changes. In accordance with the VHWMR, under 40 CFR § 270.42, Appendix I, Section C.2 and based upon the accuracy of the information contained in the Permittee's correspondence dated August 13, 2014, the requested Class 1 modifications to the permit are approved.

Enclosed are the final modified pages in electronic format to be inserted into the RAAP's copy of the hazardous waste permit.

All conditions and requirements of the facility Permit shall remain in effect for the duration of the Permit unless the existing Permit is modified, revoked and reissued, or terminated in accordance with 40 CFR § 124.5, and 40 CFR § 270.41 through 270.42, or continued in accordance with 9 VAC 20-60-270.B.5.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision to initiate a legal appeal by filing a notice of appeal with:

David K. Paylor, Director
Department of Environmental Quality
629 East Main Street
P.O. Box 1105
Richmond, VA 23218

In the event that this decision is served to you by mail, the date of service will be calculated as three days after the postmark date. Please refer to Part 2A of the Rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specifications

of the Circuit Court to which the appeal is taken, and additional requirements concerning appeals from decisions of administrative agencies.

This above Class 1 permit modification under 40 CFR § 270.42(a)(1) requires the Permittee to send a notice of the modification to all persons on the facility mailing list (attached) within 90 days after the change is put into effect. In addition, RAAP must provide documentation to this Office regarding compliance with the public notice requirement. Please submit evidence of this mailing (return receipts, copy of the notification letter) when it is available.

If you should have any questions regarding these matters, please contact Russell McAvoy, Jr., PE, Environmental Engineer Senior, at (804) 698-4194 or by e-mail at russell.mcavoy@deq.virginia.gov.

Sincerely,

Leslie A. Romanchik

Leslie A. Romanchik
Hazardous Waste Program Manager
Office of Waste Permitting and Compliance

Enclosures: Facility Mailing List, Modified Permit Pages

cc: Andrea Barbieri – EPA, Region III (3LC50) e/enclosures
Jutta Schneider – DEQ, CO
Kurt Kochan – DEQ, CO
Aziz Farahmand – DEQ, BRRO
Elizabeth Lohman – DEQ, BRRO
Julia King–Collins – DEQ, CO
Central Hazardous Waste Files

APPENDIX C
LABORATORY ANALYTICAL RESULTS – YEAR 2015
(CD-ROM)

CompuChem
A Division Of
Liberty Analytical Corp.

Abridged data package. Full deliverable available upon request.

5/8/2015

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP APPIX 2015 UNIT 5

WorkOrder: 1504088

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504088

Project: RAAP APPIX 2015 UNIT 5 **Sdg:** 1504088

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504088-01	5W7B	Water	04/21/2015 09:50	04/23/2015 14:10
1504088-02	5W5B	Water	04/20/2015 11:10	04/23/2015 14:10
1504088-03	5WC21	Water	04/20/2015 12:25	04/23/2015 14:10
1504088-04	5WDUP	Water	04/20/2015 12:30	04/23/2015 14:10
1504088-05	5WC22	Water	04/20/2015 13:25	04/23/2015 14:10
1504088-06	5WC23	Water	04/20/2015 14:30	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

Laboratory: COMPUCHEM

SDG: 1504088

Client Sample Id:	Analysis:	Lab Sample Id:
5W7B	EPA 7470A	1504088-01
5W7B	EPA 6020A	1504088-01
5W5B	EPA 7470A	1504088-02
5W5B	EPA 6020A	1504088-02
5WC21	EPA 7470A	1504088-03
5WC21	EPA 6020A	1504088-03
5WDUP	EPA 7470A	1504088-04
5WDUP	EPA 6020A	1504088-04
5WC22	EPA 7470A	1504088-05
5WC22	EPA 6020A	1504088-05
5WC23	EPA 7470A	1504088-06
5WC23	EPA 6020A	1504088-06

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 04/30/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1504088
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2015 UNIT 5

The indicated Sample Delivery Group (SDG) consisting of six (6) water samples was received into the laboratory information management system (LIMS) on April 23, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The cooler temperature indicator bottle was found with the samples and the samples temperature was -0.1, -0.2, -0.4, and 0.7 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A/7470A methodology for the requested metals and mercury.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Antimony for sample 5W7B

$$\frac{0.31629\ \mu g/L\ (C) \times 0.10\ L\ (F)}{0.10\ L\ (I)} = 0.316\ \mu g/L \text{ reported as } 2.00\ U\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5042402-MS1 (5W7BS) was found to be inside control limits.

The mercury sample matrix spike, CCN = 5042403-MS1 (5W7BS) was found to be outside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5042402-MS1 (5W7BS) was found to be inside control limits.

The mercury sample matrix duplicate spike, CCN = 5042403-MSD1 (5W7BSD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5042402-DUP1 (5W7BD) was found to be inside control limits.

The mercury sample duplicate, CCN = 5042403-DUP1 (5W7BD) was found to be inside control limits.

A five-fold serial dilution of sample, CCN = SDI1504088-01 (5W7BL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5042402-PS1 (5W7BA) was performed and passed criteria except zinc.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
April 30, 2015

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

4/9/2015

Client: Draper Aden Associates **Attn:** 0 **Address:** 0 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU5 **Event:** 2Q 2015 GW Corrective Action Monitoring Event **DAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES **Carrier:** DASHCOURIER **Tracking Number:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type	G	G	G
Box 3 - Filtered/Unfiltered	U	U	U
Required pH of Sample	<2	<2	
Box 2 - Preservative	B	B	H
Box 5 - Sample Container Type	1-500ml P	1-500ml P	2-1L A

GENERAL NOTES:
1. Report results with 'J' or 'B' flag, (report estimated results).
2. ERIS required. VELAP Accreditation required
3. Project specific MDL/QL's attached.

4. Cobalt
QL = 5ug/L MDL 1ug/L
JWR 4/7/15

Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	(Metals-Total) 6020A(3005A)/ 7470A	Cobalt only-Total 6020A/3005A	8270D/3510C (Semivolatiles)	metals pH					
5W8B	4/20	1020	GW	1		X					1504089-01		upgradient monitoring well
5W5B	4/20	1110	GW	3	X		X	<2			1504088-02		
5W7B	4/20	1215	GW	3	X		X	<2			-01		USE FOR QC
5WC21	4/20	1225	GW	3	X		X	<2			-03		
5WDUP	4/20	1230	GW	3	X		X	<2			-04		
5WC22	4/20	1325	GW	3	X		X	<2			-05		
5WC23	4/20	1430	GW	3	X		X	<2			-06		
5W12A	4/21	1055	GW	1		X					1504089-02		received 2 amber liters plume well for 5W12A/ not on COC @ 4/23/15

Clients Special Instructions: level 4 with edd. 0.7°C, -0.2°C, -0.4°C, -0.1°C

Cobalt only in cooler @ -0.2°C 4/23/15

Received by lab in Good Condition ✓ Yes ___ No Custody Seal Intact ✓ Yes ___ No Temperature upon arrival ✓ Received on Ice ✓ Yes ___ No

Describe problems, if any:

metals 5WDUP in 0.7°C (6)
5WC23 in -0.4°C (6)

Sampler Name (Print): KEN CODDINGTON	Date: 4/20/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): Taylor	Date: 4/23/15	Sample Storage Time Requested:
Sampler Signature:	Time 0800	Company Name: DAA	Time: 1035	Company Name: Dash Courier	Time: 1410	
Sampler Name (Print): Tyler Emery	Date: 4/20/15	#1 Received by (Signature): Taylor	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time 0800	Company Name: DAA	Time: 10:30	Company Name: CompuChem	Time: 1410	

1/3 4.5.2015

HOLDING TIME SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
5W7B	04/21/15	04/23/15	04/24/15	04/30/15	9.0	180	
5W5B	04/20/15	04/23/15	04/24/15	04/30/15	10.0	180	
5WC21	04/20/15	04/23/15	04/24/15	04/30/15	9.9	180	
5WDUP	04/20/15	04/23/15	04/24/15	04/30/15	9.9	180	
5WC22	04/20/15	04/23/15	04/24/15	04/30/15	9.9	180	
5WC23	04/20/15	04/23/15	04/24/15	04/30/15	9.9	180	

HOLDING TIME SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
5W7B	04/21/15	04/23/15	04/24/15	04/27/15	6.0	28	
5W5B	04/20/15	04/23/15	04/24/15	04/27/15	7.0	28	
5WC21	04/20/15	04/23/15	04/24/15	04/27/15	6.9	28	
5WDUP	04/20/15	04/23/15	04/24/15	04/27/15	6.9	28	
5WC22	04/20/15	04/23/15	04/24/15	04/27/15	6.9	28	
5WC23	04/20/15	04/23/15	04/24/15	04/27/15	6.9	28	

METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504088

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP APPIX 2015 UNIT 5

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Antimony	0.4	2.00	ug/L	EPA 6020A
Arsenic	2	10.0	ug/L	EPA 6020A
Barium	1	10.0	ug/L	EPA 6020A
Beryllium	0.2	1.00	ug/L	EPA 6020A
Cadmium	0.2	1.00	ug/L	EPA 6020A
Chromium	1	5.00	ug/L	EPA 6020A
Cobalt	1	5.00	ug/L	EPA 6020A
Copper	1	5.00	ug/L	EPA 6020A
Lead	0.2	1.00	ug/L	EPA 6020A
Nickel	2	10.0	ug/L	EPA 6020A
Selenium	3	10.0	ug/L	EPA 6020A
Silver	0.2	2.00	ug/L	EPA 6020A
Thallium	0.2	1.00	ug/L	EPA 6020A
Vanadium	1	10.0	ug/L	EPA 6020A
Zinc	3	10.0	ug/L	EPA 6020A

METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504088

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP APPIX 2015 UNIT 5

Matrix: Water **Instrument:** V4

Analyte	MDL	RL	Units	Method
Mercury	0.2	2.00	ug/L	EPA 7470A

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LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042402-BS1 Matrix: Water Client ID: MLCSWL Batch: 5042402

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Antimony	220.0	203	92.3		80 - 120
Arsenic	220.0	195	88.8		80 - 120
Barium	110.0	107	97.1		80 - 120
Beryllium	110.0	104	94.4		80 - 120
Cadmium	110.0	102	92.6		80 - 120
Chromium	110.0	99.3	90.3		80 - 120
Cobalt	110.0	103	94.0		80 - 120
Copper	110.0	107	97.1		80 - 120
Lead	220.0	219	99.4		80 - 120
Nickel	110.0	108	98.0		80 - 120
Selenium	220.0	190	86.5		80 - 120
Silver	110.0	98.0	89.1		80 - 120
Thallium	220.0	224	102		80 - 120
Vanadium	110.0	102	92.3		80 - 120
Zinc	220.0	195	88.6		80 - 120

LCS / LCS DUPLICATE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042403-BS1 Matrix: Water Client ID: MLCSWM Batch: 5042403

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Mercury	4.000	3.77	94		80 - 120

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W7BS

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042402-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Antimony	220.0	2.00 U	205	93.0		75 - 125
Arsenic	220.0	10.0 U	200	91.1		75 - 125
Barium	110.0	40.3	151	101		75 - 125
Beryllium	110.0	1.00 U	112	102		75 - 125
Cadmium	110.0	1.00 U	110	99.9		75 - 125
Chromium	110.0	5.00 U	107	97.4		75 - 125
Cobalt	110.0	2.34 J	107	94.7		75 - 125
Copper	110.0	1.52 J	104	93.4		75 - 125
Lead	220.0	0.603 J	232	105		75 - 125
Nickel	110.0	10.0 U	106	96.0		75 - 125
Selenium	220.0	10.0 U	193	87.8		75 - 125
Silver	110.0	2.00 U	107	97.5		75 - 125
Thallium	220.0	1.00 U	240	109		75 - 125
Vanadium	110.0	10.0 U	110	99.7		75 - 125
Zinc	220.0	16.7	205	85.5		75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W7BSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042402-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Antimony	220.0	206	93.8	0.846		20	75 - 125
Arsenic	220.0	200	90.7	0.423		20	75 - 125
Barium	110.0	148	98.3	2.26		20	75 - 125
Beryllium	110.0	106	96.6	5.14		20	75 - 125
Cadmium	110.0	105	95.7	4.30		20	75 - 125
Chromium	110.0	105	95.3	2.12		20	75 - 125
Cobalt	110.0	111	98.9	4.35		20	75 - 125
Copper	110.0	107	96.2	2.89		20	75 - 125
Lead	220.0	225	102	3.04		20	75 - 125
Nickel	110.0	111	101	4.80		20	75 - 125
Selenium	220.0	193	87.9	0.121		20	75 - 125
Silver	110.0	99.7	90.7	7.22		20	75 - 125
Thallium	220.0	221	101	8.34		20	75 - 125
Vanadium	110.0	106	96.0	3.79		20	75 - 125
Zinc	220.0	208	87.1	1.88		20	75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

5W7BS

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042403-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Mercury	1.000	2.00 U	0.963	96		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

5W7BSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042403-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Mercury	1.000	0.970	97	0.7		20	75 - 125

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SERIAL DILUTION

EPA 6020A

5W7BL

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5D30007-SRD1 Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

Sequence: 5D30007 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Antimony	2.00 U	10.00 U	2.00			EPA 6020A	10
Arsenic	10.00 U	50.00 U	10.0			EPA 6020A	10
Barium	40.35	36.70 J	10.0	9.04		EPA 6020A	10
Beryllium	1.00 U	5.00 U	1.00			EPA 6020A	10
Cadmium	1.00 U	5.00 U	1.00			EPA 6020A	10
Chromium	5.00 U	25.00 U	5.00			EPA 6020A	10
Cobalt	2.34 J	25.00 U	5.00			EPA 6020A	10
Copper	1.52 J	25.00 U	5.00			EPA 6020A	10
Lead	0.60 J	5.00 U	1.00			EPA 6020A	10
Nickel	10.00 U	50.00 U	10.0			EPA 6020A	10
Selenium	10.00 U	50.00 U	10.0			EPA 6020A	10
Silver	2.00 U	10.00 U	2.00			EPA 6020A	10
Thallium	1.00 U	5.00 U	1.00			EPA 6020A	10
Vanadium	10.00 U	50.00 U	10.0			EPA 6020A	10
Zinc	16.65	29.18 J	10.0	75.3		EPA 6020A	10

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020A

5W7BA

Laboratory: COMPUCHEM
Client: DRAPER ADEN ASSOCIATES
Matrix: Water

SDG: 1504088
Project: RAAP APPIX 2015 UNIT 5
Laboratory ID: 5042402-PS1
Lab Source ID: 1504088-01

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Antimony	18.3	U	20.00	89.9	75 - 125
Arsenic	8.77	U	10.00	87.5	75 - 125
Barium	133	40.3	100.0	92.2	75 - 125
Beryllium	9.07	U	10.00	89.7	75 - 125
Cadmium	9.53	U	10.00	95.0	75 - 125
Chromium	19.4	U	20.00	92.8	75 - 125
Cobalt	11.2	2.34 J	10.00	88.2	75 - 125
Copper	20.0	1.52 J	20.00	92.2	75 - 125
Lead	11.1	0.603 J	10.00	105	75 - 125
Nickel	11.2	U	10.00	92.2	75 - 125
Selenium	41.0	U	50.00	81.8	75 - 125
Silver	9.48	U	10.00	94.2	75 - 125
Thallium	10.7	U	10.00	106	75 - 125
Vanadium	47.3	U	50.00	94.4	75 - 125
Zinc	29.1	**16.7**	**20.00**	**62.4**	**75 - 125**

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DUPLICATES

EPA 6020A

5W7BD

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042402-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Antimony	20	*2.00 U*	2.00 U			EPA 6020A
Arsenic	20	*10.0 U*	10.0 U			EPA 6020A
Barium	20	*40.3*	38.9	3.63		EPA 6020A
Beryllium	20	*1.00 U*	1.00 U			EPA 6020A
Cadmium	20	*1.00 U*	1.00 U			EPA 6020A
Chromium	20	*5.00 U*	5.00 U			EPA 6020A
Cobalt	20	*2.34 J*	2.22 J	5.50		EPA 6020A
Copper	20	*1.52 J*	1.45 J	4.15		EPA 6020A
Lead	20	*0.603 J*	0.567 J	6.20		EPA 6020A
Nickel	20	*10.0 U*	10.0 U			EPA 6020A
Selenium	20	*10.0 U*	10.0 U			EPA 6020A
Silver	20	*2.00 U*	2.00 U			EPA 6020A
Thallium	20	*1.00 U*	1.00 U			EPA 6020A
Vanadium	20	*10.0 U*	10.0 U			EPA 6020A
Zinc	20	*16.7*	11.0	40.5		EPA 6020A

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DUPLICATES

EPA 7470A

5W7BD

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042403-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Mercury	20	*2.00 U*	2.00 U			EPA 7470A

PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Batch: 5042402 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
5W7B	1504088-01	04/24/15 09:40	100	100
5W5B	1504088-02	04/24/15 09:40	100	100
5WC21	1504088-03	04/24/15 09:40	100	100
5WDUP	1504088-04	04/24/15 09:40	100	100
5WC22	1504088-05	04/24/15 09:40	100	100
5WC23	1504088-06	04/24/15 09:40	100	100
PBWWL	5042402-BLK1	04/24/15 09:40	100	100
MLCSWL	5042402-BS1	04/24/15 09:40	100	100
5W7BD	5042402-DUP1	04/24/15 09:40	100	100
5W7BS	5042402-MS1	04/24/15 09:40	100	100
5W7BSD	5042402-MSD1	04/24/15 09:40	100	100
5W7BA	5042402-PS1	04/24/15 09:40	100	100

PREPARATION BATCH SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Batch: 5042403 Matrix: Water Preparation: EPA 7470A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
5W7B	1504088-01	04/24/15 10:30	100	100
5W5B	1504088-02	04/24/15 10:30	100	100
5WC21	1504088-03	04/24/15 10:30	100	100
5WDUP	1504088-04	04/24/15 10:30	100	100
5WC22	1504088-05	04/24/15 10:30	100	100
5WC23	1504088-06	04/24/15 10:30	100	100
PBWWM	5042403-BLK1	04/24/15 10:30	100	100
MLCSWM	5042403-BS1	04/24/15 10:30	100	100
5W7BD	5042403-DUP1	04/24/15 10:30	100	100
5W7BS	5042403-MS1	04/24/15 10:30	100	100
5W7BSD	5042403-MSD1	04/24/15 10:30	100	100

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ANALYSIS SEQUENCE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D27008 Calibration: 5042801 Instrument: V4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
S0	5D27008-CAL1	5D27008_P-001	04/27/15 09:54:13
0.2	5D27008-CAL2	5D27008_P-002	04/27/15 09:57:16
S0.5	5D27008-CAL3	5D27008_P-003	04/27/15 10:00:17
S1.0	5D27008-CAL4	5D27008_P-004	04/27/15 10:02:56
S5.0	5D27008-CAL5	5D27008_P-005	04/27/15 10:05:25
S10.0	5D27008-CAL6	5D27008_P-006	04/27/15 10:08:07
ICV	5D27008-ICV1	5D27008_P-007	04/27/15 10:10:38
ICB	5D27008-ICB1	5D27008_P-008	04/27/15 10:14:50
CCV	5D27008-CCV1	5D27008_P-010	04/27/15 10:21:24
CCB	5D27008-CCB1	5D27008_P-011	04/27/15 10:24:32
PBWWM	5042403-BLK1	5D27008_P-012	04/27/15 10:27:20
MLCSWM	5042403-BS1	5D27008_P-013	04/27/15 10:30:19
5W7B	1504088-01	5D27008_P-015	04/27/15 10:35:25
5W7BD	5042403-DUP1	5D27008_P-016	04/27/15 10:38:08
5W7BS	5042403-MS1	5D27008_P-017	04/27/15 10:40:41
5W7BSD	5042403-MSD1	5D27008_P-018	04/27/15 10:43:22
5W5B	1504088-02	5D27008_P-019	04/27/15 10:46:16
5WC21	1504088-03	5D27008_P-020	04/27/15 10:49:16
5WDUP	1504088-04	5D27008_P-021	04/27/15 10:51:48
CCV	5D27008-CCV2	5D27008_P-022	04/27/15 10:54:17
CCB	5D27008-CCB2	5D27008_P-023	04/27/15 10:56:56
5WC22	1504088-05	5D27008_P-024	04/27/15 11:00:08
5WC23	1504088-06	5D27008_P-025	04/27/15 11:02:52
CCV	5D27008-CCV3	5D27008_P-034	04/27/15 11:26:52
CCB	5D27008-CCB3	5D27008_P-035	04/27/15 11:29:22

ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
TUN1	5D30007-TUN1	5D30007_P-001	04/30/15 08:33:23
S0	5D30007-CAL1	5D30007_P-002	04/30/15 09:49:11
S 6020-MS1	5D30007-CAL2	5D30007_P-003	04/30/15 09:50:59
S 6020-MS2	5D30007-CAL3	5D30007_P-004	04/30/15 09:52:45
S 6020-MS3	5D30007-CAL4	5D30007_P-005	04/30/15 09:54:32
S 6020-MS4	5D30007-CAL5	5D30007_P-006	04/30/15 09:56:19
S 6020-MS5	5D30007-CAL6	5D30007_P-007	04/30/15 09:58:06
LLICV	5D30007-CRL1	5D30007_P-008	04/30/15 10:01:34
ICV	5D30007-ICV1	5D30007_P-009	04/30/15 10:03:22
ICB	5D30007-ICB1	5D30007_P-010	04/30/15 10:05:10
ICSA	5D30007-IFA1	5D30007_P-011	04/30/15 10:06:57
ICSAB	5D30007-IFB1	5D30007_P-012	04/30/15 10:08:44
LLCCV	5D30007-CRL2	5D30007_P-013	04/30/15 10:10:32
CCV	5D30007-CCV1	5D30007_P-014	04/30/15 10:12:20
CCB	5D30007-CCB1	5D30007_P-015	04/30/15 10:14:07
PBWWL	5042402-BLK1	5D30007_P-016	04/30/15 10:17:54
MLCSWL	5042402-BS1	5D30007_P-017	04/30/15 10:19:41
5W7B	1504088-01	5D30007_P-019	04/30/15 10:23:15
5W7BD	5042402-DUP1	5D30007_P-020	04/30/15 10:25:02
5W7BS	5042402-MS1	5D30007_P-021	04/30/15 10:26:49
5W7BSD	5042402-MSD1	5D30007_P-022	04/30/15 10:28:36
5W7BL	5D30007-SRD1	5D30007_P-023	04/30/15 10:30:23
5W7BA	5042402-PS1	5D30007_P-024	04/30/15 10:32:10
LLCCV	5D30007-CRL3	5D30007_P-025	04/30/15 10:33:58
CCV	5D30007-CCV2	5D30007_P-026	04/30/15 10:35:46
CCB	5D30007-CCB2	5D30007_P-027	04/30/15 10:37:33
5W5B	1504088-02	5D30007_P-028	04/30/15 10:50:21
5WC21	1504088-03	5D30007_P-029	04/30/15 10:52:08
5WDUP	1504088-04	5D30007_P-030	04/30/15 10:53:55

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
5WC22	1504088-05	5D30007_P-031	04/30/15 10:55:41
5WC23	1504088-06	5D30007_P-032	04/30/15 10:57:28
CCV	5D30007-CCV3	5D30007_P-038	04/30/15 11:08:11
CCB	5D30007-CCB3	5D30007_P-039	04/30/15 11:09:58
LLCCV	5D30007-CRL4	5D30007_P-049	04/30/15 11:27:49
CCV	5D30007-CCV4	5D30007_P-050	04/30/15 11:29:37
CCB	5D30007-CCB4	5D30007_P-051	04/30/15 11:31:24

ANALYSIS DATA SHEET

5W7B

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-01 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-39-3	Barium	40.3	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:23
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-48-4	Cobalt	2.34	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:23
7440-50-8	Copper	1.52	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:23
7439-92-1	Lead	0.603	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:23
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 10:35
7440-02-0	Nickel		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:23
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:23
7440-66-6	Zinc	16.7	3.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:23

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ANALYSIS DATA SHEET

5W5B

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-02 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-39-3	Barium	26.0	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:50
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-50-8	Copper	1.64	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:50
7439-92-1	Lead	0.774	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:50
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 10:46
7440-02-0	Nickel	2.15	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:50
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-28-0	Thallium	0.318	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:50
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:50
7440-66-6	Zinc	7.11	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:50

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ANALYSIS DATA SHEET

5WC21

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-03 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:52
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:52
7440-39-3	Barium	13.6	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:52
7440-41-7	Beryllium	0.912	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:52
7440-43-9	Cadmium	0.548	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:52
7440-47-3	Chromium	4.17	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:52
7440-48-4	Cobalt	64.9	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 10:52
7440-50-8	Copper	3.93	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:52
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:52
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 10:49
7440-02-0	Nickel	33.9	2.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:52
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:52
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:52
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:52
7440-62-2	Vanadium	1.26	1.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:52
7440-66-6	Zinc	30.3	3.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:52

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ANALYSIS DATA SHEET

5WDUP

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-04 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:53
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:53
7440-39-3	Barium	14.6	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:53
7440-41-7	Beryllium	0.976	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:53
7440-43-9	Cadmium	0.581	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:53
7440-47-3	Chromium	4.47	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:53
7440-48-4	Cobalt	69.4	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 10:53
7440-50-8	Copper	4.03	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:53
7439-92-1	Lead	0.224	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:53
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 10:51
7440-02-0	Nickel	34.0	2.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:53
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:53
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:53
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:53
7440-62-2	Vanadium	1.34	1.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:53
7440-66-6	Zinc	33.7	3.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:53

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ANALYSIS DATA SHEET

5WC22

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-05 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-39-3	Barium	31.3	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:55
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-43-9	Cadmium	0.315	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:55
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-48-4	Cobalt	17.0	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 10:55
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7439-92-1	Lead	0.202	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:55
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:00
7440-02-0	Nickel	7.22	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:55
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:55
7440-66-6	Zinc	6.89	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:55

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ANALYSIS DATA SHEET

5WC23

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 1504088-06 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-39-3	Barium	34.3	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:57
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-43-9	Cadmium	0.318	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:57
7440-47-3	Chromium	2.87	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:57
7440-48-4	Cobalt	11.1	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 10:57
7440-50-8	Copper	2.98	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 10:57
7439-92-1	Lead	0.827	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 10:57
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:02
7440-02-0	Nickel	8.86	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:57
7782-49-2	Selenium		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-22-4	Silver		0.200	2.00	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 10:57
7440-62-2	Vanadium	3.76	1.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 10:57
7440-66-6	Zinc	12.1	3.00	10.0	1		EPA 6020A	5D30007	4/30/15 10:57

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LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLICV	5D30007-CRL1	Antimony	2.000	1.99	100	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Arsenic	1.000	1.17	117	ug/L	U	70 - 130
LLICV	5D30007-CRL1	Barium	10.00	9.42	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Beryllium	1.000	0.984	98	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cadmium	1.000	0.936	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Chromium	2.000	1.99	100	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cobalt	1.000	1.06	106	ug/L		70 - 130
LLICV	5D30007-CRL1	Copper	2.000	2.03	102	ug/L		70 - 130
LLICV	5D30007-CRL1	Lead	1.000	1.09	109	ug/L		70 - 130
LLICV	5D30007-CRL1	Nickel	1.000	1.10	110	ug/L	U	70 - 130
LLICV	5D30007-CRL1	Selenium	5.000	4.67	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Silver	1.000	1.16	116	ug/L		70 - 130
LLICV	5D30007-CRL1	Thallium	1.000	1.13	113	ug/L		70 - 130
LLICV	5D30007-CRL1	Vanadium	5.000	4.75	95	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Zinc	2.000	1.70	85	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Antimony	2.000	1.76	88	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Arsenic	1.000	0.875	88	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Barium	10.00	9.41	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Beryllium	1.000	0.930	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cadmium	1.000	0.927	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Chromium	2.000	1.85	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cobalt	1.000	0.901	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Copper	2.000	1.89	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Lead	1.000	0.955	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Nickel	1.000	0.942	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Selenium	5.000	3.94	79	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Silver	1.000	0.885	89	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Thallium	1.000	0.942	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Vanadium	5.000	4.74	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Zinc	2.000	1.72	86	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Antimony	2.000	1.70	85	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Arsenic	1.000	0.748	75	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Barium	10.00	9.11	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Beryllium	1.000	0.917	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Chromium	2.000	1.72	86	ug/L	J	70 - 130

LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLCCV	5D30007-CRL3	Cobalt	1.000	0.902	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Copper	2.000	1.84	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Lead	1.000	0.941	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Nickel	1.000	0.935	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Selenium	5.000	3.63	73	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Silver	1.000	0.872	87	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Thallium	1.000	0.982	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Vanadium	5.000	4.56	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Zinc	2.000	1.73	87	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Antimony	2.000	1.63	82	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Arsenic	1.000	1.05	105	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Barium	10.00	9.34	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Beryllium	1.000	0.950	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Chromium	2.000	1.90	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Cobalt	1.000	0.968	97	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Copper	2.000	1.95	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Lead	1.000	0.960	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Nickel	1.000	0.981	98	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Selenium	5.000	4.46	89	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Silver	1.000	0.840	84	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Thallium	1.000	0.960	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Vanadium	5.000	5.01	100	ug/L		70 - 130
LLCCV	5D30007-CRL4	Zinc	2.000	1.82	91	ug/L	U	70 - 130

INITIAL CALIBRATION DATA

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Mercury	CAL1	S0	-42	0
Mercury	CAL2	0.2	1014	0.2
Mercury	CAL3	S0.5	2514	0.5
Mercury	CAL4	S1.0	4831	1
Mercury	CAL5	S5.0	25642	5
Mercury	CAL6	S10.0	51082	10

INITIAL CALIBRATION DATA (Continued)

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Mercury	0.0001953	0.01519	0.9999	0.995	

INITIAL CALIBRATION DATA

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Antimony	CAL1	S0	1957.147	0
Antimony	CAL2	S 6020-MS1	20983.11	2
Antimony	CAL3	S 6020-MS2	38450.21	4
Antimony	CAL4	S 6020-MS3	1328313	125
Antimony	CAL5	S 6020-MS4	2528040	250
Antimony	CAL6	S 6020-MS5	4756906	500
Arsenic	CAL1	S0	446.204	0
Arsenic	CAL2	S 6020-MS1	3062.335	1
Arsenic	CAL3	S 6020-MS2	5800.116	2
Arsenic	CAL4	S 6020-MS3	369236	125
Arsenic	CAL5	S 6020-MS4	752052.5	250
Arsenic	CAL6	S 6020-MS5	1466888	500
Barium	CAL1	S0	48.889	0
Barium	CAL2	S 6020-MS1	44368.78	10
Barium	CAL3	S 6020-MS2	84332.13	20
Barium	CAL4	S 6020-MS3	613986.2	125
Barium	CAL5	S 6020-MS4	1133056	250
Barium	CAL6	S 6020-MS5	2049108	500
Beryllium	CAL1	S0	3.333	0
Beryllium	CAL2	S 6020-MS1	330.561	1
Beryllium	CAL3	S 6020-MS2	692.246	2
Beryllium	CAL4	S 6020-MS3	46701.1	125
Beryllium	CAL5	S 6020-MS4	90208.43	250
Beryllium	CAL6	S 6020-MS5	182495.9	500
Cadmium	CAL1	S0	13.03	0
Cadmium	CAL2	S 6020-MS1	2876.564	1
Cadmium	CAL3	S 6020-MS2	5635.464	2

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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Cadmium	CAL4	S 6020-MS3	387923	125
Cadmium	CAL5	S 6020-MS4	750563.9	250
Cadmium	CAL6	S 6020-MS5	1375188	500
Chromium	CAL1	S0	13376.17	0
Chromium	CAL2	S 6020-MS1	47435.57	2
Chromium	CAL3	S 6020-MS2	78210.35	4
Chromium	CAL4	S 6020-MS3	2366082	125
Chromium	CAL5	S 6020-MS4	4147018	250
Chromium	CAL6	S 6020-MS5	8398229	500
Cobalt	CAL1	S0	107.778	0
Cobalt	CAL2	S 6020-MS1	20452.02	1
Cobalt	CAL3	S 6020-MS2	39849.8	2
Cobalt	CAL4	S 6020-MS3	2821096	125
Cobalt	CAL5	S 6020-MS4	5047868	250
Cobalt	CAL6	S 6020-MS5	1.012255E+07	500
Copper	CAL1	S0	340.747	0
Copper	CAL2	S 6020-MS1	19867.88	2
Copper	CAL3	S 6020-MS2	38239.66	4
Copper	CAL4	S 6020-MS3	1308376	125
Copper	CAL5	S 6020-MS4	2470642	250
Copper	CAL6	S 6020-MS5	4683799	500
Lead	CAL1	S0	447.229	0
Lead	CAL2	S 6020-MS1	23097.85	1
Lead	CAL3	S 6020-MS2	43958.66	2
Lead	CAL4	S 6020-MS3	3081202	125
Lead	CAL5	S 6020-MS4	5582773	250
Lead	CAL6	S 6020-MS5	1.0705E+07	500
Nickel	CAL1	S0	44.445	0
Nickel	CAL2	S 6020-MS1	4362.064	1
Nickel	CAL3	S 6020-MS2	8650.036	2
Nickel	CAL4	S 6020-MS3	614451.9	125
Nickel	CAL5	S 6020-MS4	1080344	250
Nickel	CAL6	S 6020-MS5	2091607	500
Selenium	CAL1	S0	393.897	0
Selenium	CAL2	S 6020-MS1	1544.935	5

Selenium	CAL3	S 6020-MS2	2688.324	10
Selenium	CAL4	S 6020-MS3	31638.17	125
Selenium	CAL5	S 6020-MS4	68584.54	250
Selenium	CAL6	S 6020-MS5	131304.3	500
Silver	CAL1	S0	879.671	0
Silver	CAL2	S 6020-MS1	14141.48	1
Silver	CAL3	S 6020-MS2	26287.32	2
Silver	CAL4	S 6020-MS3	1838433	125
Silver	CAL5	S 6020-MS4	3581159	250
Silver	CAL6	S 6020-MS5	6539745	500
Thallium	CAL1	S0	208.336	0
Thallium	CAL2	S 6020-MS1	22778.69	1
Thallium	CAL3	S 6020-MS2	44091.45	2
Thallium	CAL4	S 6020-MS3	3006076	125
Thallium	CAL5	S 6020-MS4	5646920	250
Thallium	CAL6	S 6020-MS5	1.072388E+07	500
Vanadium	CAL1	S0	4487.947	0
Vanadium	CAL2	S 6020-MS1	103931.2	5
Vanadium	CAL3	S 6020-MS2	195195.4	10
Vanadium	CAL4	S 6020-MS3	2720837	125
Vanadium	CAL5	S 6020-MS4	4931022	250
Vanadium	CAL6	S 6020-MS5	9647104	500
Zinc	CAL1	S0	249.077	0
Zinc	CAL2	S 6020-MS1	4652.008	2
Zinc	CAL3	S 6020-MS2	8872.454	4
Zinc	CAL4	S 6020-MS3	296953	125
Zinc	CAL5	S 6020-MS4	593065.2	250
Zinc	CAL6	S 6020-MS5	1182811	500

INITIAL CALIBRATION DATA (Continued)

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Antimony	0.002228	0	0.9999	0.998	
Arsenic	0.001206	0	0.9994	0.998	
Barium	0.0009696	0	0.9997	0.998	
Beryllium	0.001811	0	0.9997	0.998	
Cadmium	0.0007179	0	0.9999	0.998	
Chromium	0.006870	0	0.9999	0.998	
Cobalt	0.008309	0	0.9999	0.998	
Copper	0.003892	0	0.9994	0.998	
Lead	0.008481	0	0.9999	0.998	
Nickel	0.001734	0	0.9997	0.998	
Selenium	0.0001078	0	0.9990	0.998	
Silver	0.003416	0	0.9999	0.998	
Vanadium	0.007959	0	0.9998	0.998	
Zinc	0.0009687	0	0.9996	0.998	

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D27008-ICV1	Mercury	4.000	3.98	100	ug/L		+/-20
CCV	5D27008-CCV1	Mercury	5.000	4.98	100	ug/L		+/-20
CCV	5D27008-CCV2	Mercury	5.000	4.84	97	ug/L		+/-20
CCV	5D27008-CCV3	Mercury	5.000	5.02	100	ug/L		+/-20

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D30007-ICV1	Antimony	220.0	206	94	ug/L		+/-10
ICV	5D30007-ICV1	Arsenic	220.0	205	93	ug/L		+/-10
ICV	5D30007-ICV1	Barium	110.0	109	99	ug/L		+/-10
ICV	5D30007-ICV1	Beryllium	110.0	107	97	ug/L		+/-10
ICV	5D30007-ICV1	Cadmium	110.0	104	95	ug/L		+/-10
ICV	5D30007-ICV1	Chromium	110.0	104	94	ug/L		+/-10
ICV	5D30007-ICV1	Cobalt	110.0	106	97	ug/L		+/-10
ICV	5D30007-ICV1	Copper	110.0	105	96	ug/L		+/-10
ICV	5D30007-ICV1	Lead	220.0	212	96	ug/L		+/-10
ICV	5D30007-ICV1	Nickel	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Selenium	220.0	203	93	ug/L		+/-10
ICV	5D30007-ICV1	**Silver**	**110.0**	**98.8**	90	**ug/L**		+/-10
ICV	5D30007-ICV1	Thallium	220.0	214	97	ug/L		+/-10
ICV	5D30007-ICV1	Vanadium	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Zinc	220.0	204	93	ug/L		+/-10
CCV	5D30007-CCV1	Antimony	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV1	Arsenic	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV1	Barium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV1	Beryllium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV1	Cadmium	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV1	Chromium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV1	Cobalt	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Copper	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV1	Lead	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV1	Selenium	300.0	277	93	ug/L		+/-10
CCV	5D30007-CCV1	Silver	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV1	Thallium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV1	Vanadium	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV1	Zinc	300.0	274	91	ug/L		+/-10
CCV	5D30007-CCV2	Antimony	300.0	275	92	ug/L		+/-10
CCV	5D30007-CCV2	Arsenic	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV2	Barium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Beryllium	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV2	Cadmium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV2	Chromium	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV2	Cobalt	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Copper	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV2	Lead	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV2	Nickel	300.0	288	96	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV2	Selenium	300.0	274	91	ug/L		+/-10
CCV	5D30007-CCV2	Silver	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV2	Thallium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV2	Vanadium	300.0	311	104	ug/L		+/-10
CCV	5D30007-CCV2	Zinc	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Antimony	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV3	Arsenic	300.0	275	92	ug/L		+/-10
CCV	5D30007-CCV3	Barium	300.0	284	95	ug/L		+/-10
CCV	5D30007-CCV3	Beryllium	300.0	321	107	ug/L		+/-10
CCV	5D30007-CCV3	Cadmium	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV3	Chromium	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV3	Cobalt	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Copper	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV3	Lead	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV3	Nickel	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV3	Selenium	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV3	Silver	300.0	278	93	ug/L		+/-10
CCV	5D30007-CCV3	Thallium	300.0	301	100	ug/L		+/-10
CCV	5D30007-CCV3	Vanadium	300.0	302	101	ug/L		+/-10
CCV	5D30007-CCV3	Zinc	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV4	Antimony	300.0	270	90	ug/L		+/-10
CCV	5D30007-CCV4	Arsenic	300.0	280	93	ug/L		+/-10
CCV	5D30007-CCV4	Barium	300.0	287	96	ug/L		+/-10
CCV	5D30007-CCV4	Beryllium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV4	Cadmium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV4	Chromium	300.0	313	104	ug/L		+/-10
CCV	5D30007-CCV4	Cobalt	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Copper	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV4	Lead	300.0	286	95	ug/L		+/-10
CCV	5D30007-CCV4	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Selenium	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV4	Silver	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV4	Thallium	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV4	Vanadium	300.0	312	104	ug/L		+/-10
CCV	5D30007-CCV4	Zinc	300.0	292	97	ug/L		+/-10

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units
ICSA	5D30007-IFA1	Antimony		0.00	4	ug/L
ICSA	5D30007-IFA1	Arsenic		-0.10	20	ug/L
ICSA	5D30007-IFA1	Barium		0.03	20	ug/L
ICSA	5D30007-IFA1	Beryllium		0.05	2	ug/L
ICSA	5D30007-IFA1	Cadmium		0.03	2	ug/L
ICSA	5D30007-IFA1	Chromium		0.06	10	ug/L
ICSA	5D30007-IFA1	Cobalt		0.02	10	ug/L
ICSA	5D30007-IFA1	Copper		0.10	10	ug/L
ICSA	5D30007-IFA1	Lead		0.03	2	ug/L
ICSA	5D30007-IFA1	Nickel		0.13	20	ug/L
ICSA	5D30007-IFA1	Selenium		-0.51	20	ug/L
ICSA	5D30007-IFA1	Silver		0.00	4	ug/L
ICSA	5D30007-IFA1	Thallium		0.02	2	ug/L
ICSA	5D30007-IFA1	Vanadium		-0.01	20	ug/L
ICSA	5D30007-IFA1	Zinc		0.20	20	ug/L
ICSAB	5D30007-IFB1	Antimony		-0.07	4	ug/L
ICSAB	5D30007-IFB1	Arsenic	25.00	22.42	90	ug/L
ICSAB	5D30007-IFB1	Barium		0.04	20	ug/L
ICSAB	5D30007-IFB1	Beryllium		0.03	2	ug/L
ICSAB	5D30007-IFB1	Cadmium	25.00	22.74	91	ug/L
ICSAB	5D30007-IFB1	Chromium	50.00	46.81	94	ug/L
ICSAB	5D30007-IFB1	Cobalt	50.00	45.15	90	ug/L
ICSAB	5D30007-IFB1	Copper	50.00	47.52	95	ug/L
ICSAB	5D30007-IFB1	Lead		0.01	2	ug/L
ICSAB	5D30007-IFB1	Nickel	50.00	48.25	97	ug/L
ICSAB	5D30007-IFB1	Selenium	25.00	21.69	87	ug/L
ICSAB	5D30007-IFB1	Silver	12.50	11.26	90	ug/L
ICSAB	5D30007-IFB1	Thallium		0.00	2	ug/L
ICSAB	5D30007-IFB1	Vanadium	50.00	47.78	96	ug/L
ICSAB	5D30007-IFB1	Zinc	25.00	22.49	90	ug/L

* The absence of an entry in the “True” column denotes the lack of a true value for that analyte. The entry in the “%R” column represents a Control Limit, established as +/- 2 times analyte Limit Reporting Limit.

ICP-MS Tune

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Date: 04/30/15 ICP-MS Instrument ID: PEMS

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9	8.925	0.684	10	0.802
Mg - 24	23.925	0.688	10	0.729
Mg - 25	24.975	0.704	10	0.58
Mg - 26	25.975	0.746	10	0.868
Co - 59	58.925	0.694	10	1.243
In - 113	112.925	0.674	10	1.014
In - 115	114.925	0.700	10	0.855
Pb - 206	205.975	0.700	10	0.715
Pb - 207	206.975	0.693	10	0.867
Pb - 208	207.975	0.689	10	1.39

Comments:

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504088

Sequence: 5D30007

Project: RAAP APPIX 2015 UNIT 5

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
S0	4/30/15 9:49	100	100	100	100	100
S 6020-MS1	4/30/15 9:50	98	102	99	101	102
S 6020-MS2	4/30/15 9:52	100	103	100	101	104
S 6020-MS3	4/30/15 9:54	108	106	104	105	110
S 6020-MS4	4/30/15 9:56	94	92	96	96	97
S 6020-MS5	4/30/15 9:58	94	94	88	91	95
LLICV	4/30/15 10:01	105	105	103	103	101
ICV	4/30/15 10:03	99	98	97	99	103
ICB	4/30/15 10:05	101	99	99	102	104
ICSA	4/30/15 10:06	102	99	97	101	102
ICSAB	4/30/15 10:08	97	101	98	101	102
LLCCV	4/30/15 10:10	99	99	97	99	102
CCV	4/30/15 10:12	100	99	97	101	99
CCB	4/30/15 10:14	100	100	99	96	101
PBWWL	4/30/15 10:17	97	100	98	100	99
MLCSWL	4/30/15 10:19	98	99	99	100	96
5W7B	4/30/15 10:23	100	98	93	95	92
5W7BD	4/30/15 10:25	111	103	94	98	94
5W7BS	4/30/15 10:26	102	100	90	97	93
5W7BSD	4/30/15 10:28	111	99	92	98	98
5W7BL	4/30/15 10:30	109	99	96	101	102
5W7BA	4/30/15 10:32	112	100	91	97	93
LLCCV	4/30/15 10:33	110	102	96	102	101
CCV	4/30/15 10:35	110	95	92	100	100
CCB	4/30/15 10:37	107	92	95	100	100
5W5B	4/30/15 10:50	106	86	87	93	87
5WC21	4/30/15 10:52	112	92	85	92	88
5WDUP	4/30/15 10:53	113	87	83	89	84
5WC22	4/30/15 10:55	111	92	89	101	92

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504088

Sequence: 5D30007

Project: RAAP APPIX 2015 UNIT 5

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
5WC23	4/30/15 10:57	113	95	89	101	91
CCV	4/30/15 11:08	105	96	100	105	104
CCB	4/30/15 11:09	108	100	102	110	106
LLCCV	4/30/15 11:27	103	96	104	108	109
CCV	4/30/15 11:29	110	96	102	112	108
CCB	4/30/15 11:31	112	99	106	110	113

BLANKS

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D27008-ICB1	Mercury	0.00900	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB1	Mercury	0.00100	0.200	2.00	ug/L	*U*	EPA 7470A
PBWWM	5042403-BLK1	Mercury		0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB2	Mercury	-0.00200	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB3	Mercury	-0.00500	0.200	2.00	ug/L	*U*	EPA 7470A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D30007-ICB1	Antimony	0.189	0.400	2.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Arsenic	-0.119	2.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Barium	0.0153	1.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Beryllium	0.00558	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cadmium	0.0168	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Chromium	-0.0167	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cobalt	0.00933	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Copper	0.00707	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Lead	0.0246	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Nickel	0.0124	2.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Selenium	-0.568	3.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Silver	0.0588	0.200	2.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Thallium	0.0342	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Vanadium	0.00535	1.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Zinc	0.0282	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Antimony	0.0895	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Arsenic	-0.0417	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Barium	0.144	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Beryllium	0.0232	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cadmium	0.0314	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Chromium	0.0151	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cobalt	0.0145	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Copper	0.0276	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Lead	0.0376	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Nickel	0.0369	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Selenium	-0.319	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Silver	0.166	0.200	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Thallium	0.0437	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Vanadium	0.0125	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Zinc	0.181	3.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Antimony		0.400	2.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Arsenic		2.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Barium		1.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Beryllium		0.200	1.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Cadmium		0.200	1.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Chromium		1.00	5.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
PBWWL	5042402-BLK1	Cobalt		1.00	5.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Copper		1.00	5.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Lead		0.200	1.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Nickel		2.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Selenium		3.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Silver		0.200	2.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Thallium		0.200	1.00	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Vanadium		1.00	10.0	ug/L	U	EPA 6020A
PBWWL	5042402-BLK1	Zinc		3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Antimony	0.0561	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Arsenic	-0.0226	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Barium	0.103	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Beryllium	0.00202	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Cadmium	0.000970	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Chromium	-0.0291	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Cobalt	0.00288	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Copper	0.0111	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Lead	0.0238	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Nickel	0.0358	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Selenium	-0.176	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Silver	0.126	0.200	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Thallium	0.0255	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Vanadium	-0.00719	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Zinc	0.201	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Antimony	0.0163	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Arsenic	0.107	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Barium	0.113	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Beryllium	0.0114	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Cadmium	0.00920	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Chromium	-0.131	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Cobalt	0.00579	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Copper	0.00462	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Lead	0.0227	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Nickel	0.0371	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Selenium	-0.0271	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Silver	0.103	0.200	2.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB3	Thallium	0.0263	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB3	Vanadium	-0.0303	1.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB3	Zinc	0.178	3.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Antimony	0.101	0.400	2.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Arsenic	0.186	2.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Barium	0.212	1.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Beryllium	0.0429	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Cadmium	0.0554	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Chromium	-0.0845	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Cobalt	0.0381	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Copper	0.0352	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Lead	0.0763	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Nickel	0.0644	2.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Selenium	0.149	3.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Silver	0.177	0.200	2.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Thallium	0.0779	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Vanadium	-0.000840	1.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Zinc	0.225	3.00	10.0	ug/L	*U*	EPA 6020A

METALS/MERCURY PREPARATION LOG

Metals Method: 3005A / 6020A
Mercury Method: 7470A
Prepared By: SAB

CompuChem — A Division Of Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 0940
Batch Number: 5042402
Purple Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042402-BLK1	PBWWL	MB	100	100			CS CL	CS / CL	N/A
5042402-BS1	MLCSWL	LCS	100	100			CS / CL	CS / CL	N/A
5042402-BSD1	MLCSDWL	DUP	100	100			CS / CL	CS / CL	N/A
5042402-DUP1	5W7BD	MS	100	100			CS / CL	CS / CL	12
5042402-MS1	5W7BS	MSD	100	100			CS / CL	CS / CL	12
5042402-MSD1	5W7BSD	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-01	5W7B	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-02	5W5B	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-03	5WC21	SAMPLE	100	100			BR / CY	BR / CY	12
1504088-04	5WDUP	SAMPLE	100	100			BR / CY	BR / CY	12
1504088-05	5WC22	SAMPLE	100	100			BR / CY	BR CY	12
1504088-06	5WC23	SAMPLE	100	100			BR / CY	BR / CY	12
1504091-01	16-2	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-02	16-3	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-03	16-5	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-04	16WC2B	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-05	16SPRING	SAMPLE	100	100			CS / CY	Y / CY	12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	92 C
Hot Block Temp Out:	93 C
Hot Block Identifier	MJBLOCK#1
Time Hg in water bath:	
Time Hg out water bath:	
Water Bath Temp In:	C
Water Bath Temp Out:	C
Water Bath Identifier	

MS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018
HG: 1.0mL 100ppb Hg
Ref#

LCS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018
HG: 1.0 mL of ICCV-5
Ref#

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 04/24/15

111611 JCF

METALS/MERCURY PREPARATION LOG

Metals Method: 3010A / 6010C
Mercury Method: 7470A
Prepared By: SAB

CompuChem
A Division Of
Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 1030
Batch Number: 5042403
Blue Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042403-BLK1	PBWWM	MB			100	100	CS / CL		N/A
5042403-BS1	MLCSWM	LCS			100	100	CS / CL		N/A
5042403-BSD1	MLCSDWM	LCSD			100	100	CS / CL		N/A
5042403-DUP1	5W7BD	DUP			100	100	CS / CL		12
5042403-DUP2	16WC1AD	DUP			100	100	CS / CL		12
5042403-MS1	5W7BS	MS			100	100	CS / CL		12
5042403-MS2	16WC1AS	MS			100	100	CS / CL		12
5042403-MSD1	5W7BSD	MSD			100	100	CS / CL		12
5042403-MSD2	16WC1ASD	MSD			100	100	CS / CL		12
1504088-01	5W7B	SAMPLE			100	100	CS / CL		12
1504088-02	5W5B	SAMPLE			100	100	CS / CL		12
1504088-03	5WC21	SAMPLE			100	100	BR / CY		12
1504088-04	5WDUP	SAMPLE			100	100	BR / CY		12
1504088-05	5WC22	SAMPLE			100	100	BR / CY		12
1504088-06	5WC23	SAMPLE			100	100	BR / CY		12
1504090-01	16WC1A	SAMPLE			100	100	CS / CL		12
1504090-02	16C1	SAMPLE			100	100	CS / CL		12
1504090-03	16MW8	SAMPLE			100	100	CS / CL		12
1504090-04	16MW9	SAMPLE			100	100	CS / CL		12
1504090-05	16WDUP	SAMPLE			100	100	CS / CL		12
1504090-06	16WC1B	SAMPLE			100	100	CS / CL		12
1504091-01	16-2	SAMPLE			100	100	CS / CL		12
1504091-02	16-3	SAMPLE			100	100	CS / CL		12
1504091-03	16-5	SAMPLE			100	100	CS / CL		12
1504091-04	16WC2B	SAMPLE			100	100	CS / CL		12
1504091-05	16SPRING	SAMPLE			100	100	CS / CY		12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached.

Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	C
Hot Block Temp Out:	C
Hot Block Identifier	
Time Hg in water bath:	1105
Time Hg out water bath:	1305
Water Bath Temp In:	92,93 C
Water Bath Temp Out:	92,93 C
Water Bath Identifier	Hg Baths 1+2

MS Reference

ICAP: 0.5 mL ICCV-6
Ref #:
ICAP: 0.5 mL ICCV-4
Ref#:
HG: 1.0mL 100ppb Hg
Ref# SD24005

LCS Reference

ICAP: 0.5mL ICCV-6
REF:
ICAP: 0.5mL ICCV-4
REF:
HG: 0.4 mL of HGMS-1PPM
Ref# 460107

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 4/24/15

JCF 111711

CompuChem
A Division Of
Liberty Analytical Corp.

5/8/2015

Abridged data package. Full deliverable available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP UNIT 5/2014-2015 Co ONLY

WorkOrder: 1504089

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504089

Project: RAAP UNIT 5/2014-2015 Co ONLY **Sdg:** 1504089

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504089-01	5W8B	Water	04/20/2015 10:20	04/23/2015 14:10
1504089-02	5W12A	Water	04/21/2015 10:55	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP UNIT 5/2014-2015 Co ONLY

Laboratory: COMPUCHEM

SDG: 1504089

Client Sample Id:	Analysis:	Lab Sample Id:
5W8B	EPA 6020A	1504089-01
5W12A	EPA 6020A	1504089-02

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 04/30/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1504089
Client: DRAPER
Project: RAAP UNIT 5/2014-2015 Co ONLY

The indicated Sample Delivery Group (SDG) consisting of two (2) water samples were received into the laboratory information management system (LIMS) on April 23, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The cooler temperature indicator bottle was found with the sample and the samples temperature was -0.1, -0.2, -0.4 and 0.7 degrees Celsius. Temperature was recorded by IR temperature gun.

The sample was prepared and analyzed in accordance with SW846 6020A methodology for the requested metal cobalt.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Cobalt for sample 5W8B

$$\frac{0.71296\ \mu g/L\ (C) \times 0.05\ L\ (F)}{0.05\ L\ (I)} = 0.713\ \mu g/L \text{ reported as } 5.00\ U\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5042419-MS2 (5W8BS) was found to be inside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5042419-MSD2 (5W8BSD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5042419-DUP2 (5W8BD) was found to be inside control limits.

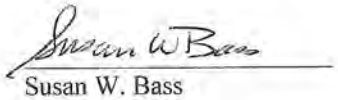
A five-fold serial dilution of sample, CCN = SDI1504089-01 (5W8BL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5042419-PS1 (5W8BA) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.



Susan W. Bass
Senior Chemist
April 30, 2015

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

4/9/2015

Client: Draper Aden Associates **Attn:** 0 **Address:** 0 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU5 **Event:** 2Q 2015 GW Corrective Action Monitoring Event **DAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES **Carrier:** DASHCOURIER **Tracking Number:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G	G						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					<2	<2							
Box 2 - Preservative					B	B	H						
Box 5 - Sample Container Type					1-500ml P	1-500ml P	2-1L A						
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**(Metals-Total) 6020A(3005A)/ 7470A**	**Cobalt only-Total 6020A/3005A**	**8270D/3510C (Semivolatiles)**	**metals pH**					
5W8B	4/20	1020	GW	1		X					1504089-01		upgradient monitoring well
5W5B	4/20	1110	GW	3	X		X	<2			1504088-02		
5W7B	4/20	1155	GW	3	X		X	<2			-01		USE FOR QC
5WC21	4/20	1225	GW	3	X		X	<2			-03		
5WDUP	4/20	1230	GW	3	X		X	<2			-04		
5WC22	4/20	1325	GW	3	X		X	<2			-05		
5WC23	4/20	1430	GW	3	X		X	<2			-06		
5W12A	4/21	1055	GW	1		X					1504089-02		received 2 amber liters plume well for 5W12A/ not on COC @ 4/23/15

GENERAL NOTES:
1. Report results with 'J' or 'B' flag, (report estimated results).
2. ERIS required. VELAP Accreditation required
3. Project specific MDL/QL's attached.

4. Cobalt
QL = 5 ug/L MDL 1 ug/L
JVR 4/7/15

Clients Special Instructions: level 4 with edd.

0.7°C, -0.2°C, -0.4°C, -0.1°C

Cobalt only in cooler @ -0.2°C 4/23/15

Received by lab in Good Condition ✓ Yes ___ No Custody Seal Intact ✓ Yes ___ No Temperature upon arrival ✓ Received on Ice ✓ Yes ___ No

Describe problems, if any:

metals 5WDUP in 0.7°C (6)
5WC23 in -0.4°C (6)

Sampler Name (Print): KEN CODDINGTON	Date: 4/20/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): Taylor	Date: 4/23/15	Sample Storage Time Requested:
Sampler Signature:	Time 0800	Company Name: DAA	Time: 1035	Company Name: Dash Courier	Time: 1410	
Sampler Name (Print): Tyler Emery	Date: 4/20/15	#1 Received by (Signature): Taylor	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time 0800	Company Name: DAA	Time: 10:30	Company Name: CompuChem	Time: 1410	

1/3 4.5.2015

HOLDING TIME SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP UNIT 5/2014-2015 Co ONLY

SDG: 1504089

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
5W8B	04/20/15	04/23/15	04/24/15	04/30/15	10.1	180	
5W12A	04/21/15	04/23/15	04/24/15	04/30/15	9.1	180	

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METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504089

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP UNIT 5/2014-2015 Co ONLY

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Cobalt	1	5.00	ug/L	EPA 6020A

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LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5042419-BS1 Matrix: Water Client ID: MLCSWS Batch: 5042419

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	102	92.8		80 - 120

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W8BS

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5042419-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504089-01 Source Sample: 5W8B

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	5.00 U	119	108		75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W8BSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5042419-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504089-01 Source Sample: 5W8B

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Cobalt	110.0	125	114	4.69		20	75 - 125

SERIAL DILUTION

EPA 6020A

5W8BL

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5D30007-SRD8 Matrix: Water Lab Source ID: 1504089-01 Source Sample: 5W8B

Sequence: 5D30007 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Cobalt	5.00 U	25.00 U	5.00			EPA 6020A	10

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020A

5W8BA

Laboratory: COMPUCHEM
Client: DRAPER ADEN ASSOCIATES
Matrix: Water

SDG: 1504089
Project: RAAP UNIT 5/2014-2015 Co ONLY
Laboratory ID: 5042419-PS1
Lab Source ID: 1504089-01

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Cobalt	10.3	U	10.00	95.5	75 - 125

DUPLICATES

EPA 6020A

5W8BD

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5042419-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1504089-01 Source Sample: 5W8B

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Cobalt	20	*5.00 U*	5.00 U			EPA 6020A

PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Batch: 5042419 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
5W8B	1504089-01	04/24/15 15:10	50.0	50.0
5W12A	1504089-02	04/24/15 15:10	50.0	50.0
PBWWS	5042419-BLK1	04/24/15 15:10	50.0	50.0
MLCSWS	5042419-BS1	04/24/15 15:10	50.0	50.0
5W8BD	5042419-DUP1	04/24/15 15:10	50.0	50.0
5W8BS	5042419-MS1	04/24/15 15:10	50.0	50.0
5W8BSD	5042419-MSD1	04/24/15 15:10	50.0	50.0
5W8BA	5042419-PS1	04/24/15 15:10	50.0	50.0

ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
TUN1	5D30007-TUN1	5D30007_P-001	04/30/15 08:33:23
S0	5D30007-CAL1	5D30007_P-002	04/30/15 09:49:11
S 6020-MS1	5D30007-CAL2	5D30007_P-003	04/30/15 09:50:59
S 6020-MS2	5D30007-CAL3	5D30007_P-004	04/30/15 09:52:45
S 6020-MS3	5D30007-CAL4	5D30007_P-005	04/30/15 09:54:32
S 6020-MS4	5D30007-CAL5	5D30007_P-006	04/30/15 09:56:19
S 6020-MS5	5D30007-CAL6	5D30007_P-007	04/30/15 09:58:06
LLICV	5D30007-CRL1	5D30007_P-008	04/30/15 10:01:34
ICV	5D30007-ICV1	5D30007_P-009	04/30/15 10:03:22
ICB	5D30007-ICB1	5D30007_P-010	04/30/15 10:05:10
ICSA	5D30007-IFA1	5D30007_P-011	04/30/15 10:06:57
ICSAB	5D30007-IFB1	5D30007_P-012	04/30/15 10:08:44
LLCCV	5D30007-CRL2	5D30007_P-013	04/30/15 10:10:32
CCV	5D30007-CCV1	5D30007_P-014	04/30/15 10:12:20
CCB	5D30007-CCB1	5D30007_P-015	04/30/15 10:14:07
LLCCV	5D30007-CRL3	5D30007_P-025	04/30/15 10:33:58
CCV	5D30007-CCV2	5D30007_P-026	04/30/15 10:35:46
CCB	5D30007-CCB2	5D30007_P-027	04/30/15 10:37:33
CCV	5D30007-CCV3	5D30007_P-038	04/30/15 11:08:11
CCB	5D30007-CCB3	5D30007_P-039	04/30/15 11:09:58
LLCCV	5D30007-CRL4	5D30007_P-049	04/30/15 11:27:49
CCV	5D30007-CCV4	5D30007_P-050	04/30/15 11:29:37
CCB	5D30007-CCB4	5D30007_P-051	04/30/15 11:31:24
CCV	5D30007-CCV5	5D30007_P-062	04/30/15 12:14:17
CCB	5D30007-CCB5	5D30007_P-063	04/30/15 12:16:04
LLCCV	5D30007-CRL5	5D30007_P-072	04/30/15 12:32:08
CCV	5D30007-CCV6	5D30007_P-073	04/30/15 12:33:56
CCB	5D30007-CCB6	5D30007_P-074	04/30/15 12:35:43
CCV	5D30007-CCV7	5D30007_P-085	04/30/15 13:16:18

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
CCB	5D30007-CCB7	5D30007_P-086	04/30/15 13:18:05
PBWWS	5042419-BLK1	5D30007_P-094	04/30/15 13:36:35
MLCSWS	5042419-BS1	5D30007_P-095	04/30/15 13:38:22
LLCCV	5D30007-CRL6	5D30007_P-096	04/30/15 13:40:10
CCV	5D30007-CCV8	5D30007_P-097	04/30/15 13:41:59
CCB	5D30007-CCB8	5D30007_P-098	04/30/15 13:43:45
5W8B	1504089-01	5D30007_P-099	04/30/15 13:50:34
5W8BD	5042419-DUP1	5D30007_P-100	04/30/15 13:52:21
5W8BS	5042419-MS1	5D30007_P-101	04/30/15 13:54:08
5W8BSD	5042419-MSD1	5D30007_P-102	04/30/15 13:55:55
5W8BA	5042419-PS1	5D30007_P-104	04/30/15 13:59:28
5W12A	1504089-02	5D30007_P-105	04/30/15 14:01:18
5W8BL	5D30007-SRD8	5D30007_P-106	04/30/15 14:03:05
LLCCV	5D30007-CRL7	5D30007_P-107	04/30/15 14:04:53
CCV	5D30007-CCV9	5D30007_P-108	04/30/15 14:06:41
CCB	5D30007-CCB9	5D30007_P-109	04/30/15 14:08:28

L. Target Element Results

(ANALYSIS DATA SHEETS)

ANALYSIS DATA SHEET

5W8B

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1504089-01 % Solid: Matrix: Water Sampled: 04/20/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 13:50

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ANALYSIS DATA SHEET

5W12A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1504089-02 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 14:01

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LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLICV	5D30007-CRL1	Cobalt	1.000	1.06	106	ug/L		70 - 130
LLCCV	5D30007-CRL2	Cobalt	1.000	0.901	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Cobalt	1.000	0.902	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Cobalt	1.000	0.968	97	ug/L	U	70 - 130
LLCCV	5D30007-CRL5	Cobalt	1.000	1.01	101	ug/L		70 - 130
LLCCV	5D30007-CRL6	Cobalt	1.000	0.942	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL7	Cobalt	1.000	0.932	93	ug/L	U	70 - 130

INITIAL CALIBRATION DATA

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089

Project: RAAP UNIT 5/2014-2015 Co ONLY

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Cobalt	CAL1	S0	107.778	0
Cobalt	CAL2	S 6020-MS1	20452.02	1
Cobalt	CAL3	S 6020-MS2	39849.8	2
Cobalt	CAL4	S 6020-MS3	2821096	125
Cobalt	CAL5	S 6020-MS4	5047868	250
Cobalt	CAL6	S 6020-MS5	1.012255E+07	500

INITIAL CALIBRATION DATA (Continued)

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089

Project: RAAP UNIT 5/2014-2015 Co ONLY

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Cobalt	0.008309	0	0.9999	0.998	

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D30007-ICV1	Cobalt	110.0	106	97	ug/L		+/-10
CCV	5D30007-CCV1	Cobalt	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV2	Cobalt	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV3	Cobalt	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV4	Cobalt	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV5	Cobalt	300.0	307	102	ug/L		+/-10
CCV	5D30007-CCV6	Cobalt	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV7	Cobalt	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV8	Cobalt	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV9	Cobalt	300.0	285	95	ug/L		+/-10

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units
ICSA	5D30007-IFA1	Cobalt		0.02	10	ug/L
ICSAB	5D30007-IFB1	Cobalt	50.00	45.15	90	ug/L

* The absence of an entry in the "True" column denotes the lack of a true value for that analyte. The entry in the "%R" column represents a Control Limit, established as +/- 2 times analyte Limit Reporting Limit.

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ICP-MS Tune

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089

Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Date: 04/30/15 ICP-MS Instrument ID: PEMS

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9	8.925	0.684	10	0.802
Mg - 24	23.925	0.688	10	0.729
Mg - 25	24.975	0.704	10	0.58
Mg - 26	25.975	0.746	10	0.868
Co - 59	58.925	0.694	10	1.243
In - 113	112.925	0.674	10	1.014
In - 115	114.925	0.700	10	0.855
Pb - 206	205.975	0.700	10	0.715
Pb - 207	206.975	0.693	10	0.867
Pb - 208	207.975	0.689	10	1.39

Comments:

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504089

Sequence: 5D30007

Project: RAAP UNIT 5/2014-2015 Co ONLY

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
S0	4/30/15 9:49	100	100	100	100	100
S 6020-MS1	4/30/15 9:50	98	102	99	101	102
S 6020-MS2	4/30/15 9:52	100	103	100	101	104
S 6020-MS3	4/30/15 9:54	108	106	104	105	110
S 6020-MS4	4/30/15 9:56	94	92	96	96	97
S 6020-MS5	4/30/15 9:58	94	94	88	91	95
LLICV	4/30/15 10:01	105	105	103	103	101
ICV	4/30/15 10:03	99	98	97	99	103
ICB	4/30/15 10:05	101	99	99	102	104
ICSA	4/30/15 10:06	102	99	97	101	102
ICSAB	4/30/15 10:08	97	101	98	101	102
LLCCV	4/30/15 10:10	99	99	97	99	102
CCV	4/30/15 10:12	100	99	97	101	99
CCB	4/30/15 10:14	100	100	99	96	101
LLCCV	4/30/15 10:33	110	102	96	102	101
CCV	4/30/15 10:35	110	95	92	100	100
CCB	4/30/15 10:37	107	92	95	100	100
CCV	4/30/15 11:08	105	96	100	105	104
CCB	4/30/15 11:09	108	100	102	110	106
LLCCV	4/30/15 11:27	103	96	104	108	109
CCV	4/30/15 11:29	110	96	102	112	108
CCB	4/30/15 11:31	112	99	106	110	113
CCV	4/30/15 12:14	105	95	107	113	111
CCB	4/30/15 12:16	108	97	108	112	114
LLCCV	4/30/15 12:32	107	98	112	115	115
CCV	4/30/15 12:33	102	100	110	113	109
CCB	4/30/15 12:35	103	96	110	114	109
CCV	4/30/15 13:16	111	109	108	109	113
CCB	4/30/15 13:18	109	107	109	115	116

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504089

Sequence: 5D30007

Project: RAAP UNIT 5/2014-2015 Co ONLY

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
PBWWS	4/30/15 13:36	106	109	109	117	118
MLCSWS	4/30/15 13:38	103	106	110	114	115
LLCCV	4/30/15 13:40	105	106	110	116	117
CCV	4/30/15 13:41	106	104	109	115	113
CCB	4/30/15 13:43	106	107	111	113	116
5W8B	4/30/15 13:50	116	110	110	112	111
5W8BD	4/30/15 13:52	116	106	104	109	109
5W8BS	4/30/15 13:54	111	106	107	110	109
5W8BSD	4/30/15 13:55	106	106	108	110	106
5W8BA	4/30/15 13:59	109	105	103	110	106
5W12A	4/30/15 14:01	114	102	99	102	98
5W8BL	4/30/15 14:03	119	108	108	112	113
LLCCV	4/30/15 14:04	115	107	108	115	115
CCV	4/30/15 14:06	106	108	108	111	111
CCB	4/30/15 14:08	107	108	111	112	114

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504089 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D30007-ICB1	Cobalt	0.00933	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB1	Cobalt	0.0145	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB2	Cobalt	0.00288	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB3	Cobalt	0.00579	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB4	Cobalt	0.0381	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB5	Cobalt	0.0162	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Cobalt	0.0193	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB7	Cobalt	0.0335	1.00	5.00	ug/L	*U*	EPA 6020A
PBWWS	5042419-BLK1	Cobalt		1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Cobalt	0.0245	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB9	Cobalt	0.0245	1.00	5.00	ug/L	*U*	EPA 6020A

METALS/MERCURY PREPARATION LOG

Metals Method: 3005A / 6020A
Mercury Method: 7470A
Prepared By: SAB

CompuChem
A Division Of
Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 1510
Batch Number: 5042419
Purple Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042419-BLK1	PBWWS	MB	50	50			CS / CL	CS / CL	N/A
5042419-BS1	MLCSWS	LCS	50	50			CS / CL	CS / CL	N/A
5042419-DUP1	5W8BD	DUP	50	50			CS / CL	CS / CL	22
5042419-MS1	5W8BS	MS	50	50			CS / CL	CS / CL	22
5042419-MSD1	5W8BSD	MSD	50	50			CS / CL	CS / CL	22
1504089-01	5W8B	SAMPLE	50	50			CS / CL	CS / CL	22
1504089-02	5W12A	SAMPLE	50	50			CS / CL	CS / CL	22

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached.

Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time		
Hot Block Temp In:	95	C
Hot Block Temp Out:	95	C
Hot Block Identifier	HCA BLOCK #2	
Time Hg in water bath:		
Time Hg out water bath:		
Water Bath Temp In:		C
Water Bath Temp Out:		C
Water Bath Identifier		

MS Reference

ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019

ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018

HG: 1.0mL 100ppb Hg
Ref#

LCS Reference

ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019

ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018

HG: 1.0 mL of ICCV-5
Ref#

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: _____
Date: 4/24/15

111611 JCF

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 · 717-656-2300 · Fax: 717-656-2681 · www.LancasterLabs.com

Abridged data package.
Full deliverable
available upon request.

Type I Data Package

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

Project: RAAP - Radford, VA - HWMU-5
Groundwater and Water Samples
Collected on 04/20/15-04/21/15

SDG# RAE35

GROUP	SAMPLE NUMBERS
1555349	7856932-7856943

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date: 05/05/2015**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Barbara Weyandt at (717) 556-7264.

2425 New Holland Pike, Lancaster, PA 17601 · 717-656-2300 · Fax: 717-656-2681 · www.LancasterLabs.com

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Sample Reference List for SDG Number RAE35
with a Data Package Type of I

11200 - Draper Aden Associates, Inc.

Project: RAAP - Radford, VA - HWMU-5

Lab Sample Number	Lab Sample Code	Client Sample Description
7856932	RAD8B	5W8B Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856933	8AD5B	5W5B Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856934	RAD7B	5W7B Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856935	RAD7B	5W7B Matrix Spike Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856936	RAD7B	5W7B Matrix Spike Dup Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856937	RAC21	5WC21 Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856938	RADDP	5WDUP Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856939	RAC22	5WC22 Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856940	RAC23	5WC23 Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856941	RAD12	5W12A Grab Groundwater 2 Qtr 2015 Corrective Action Annual Monitoring
7856942	RADT1	Trip Blank 1 Water 2 Qtr 2015 Corrective Action Annual Monitoring
7856943	RADT2	Trip Blank 2 Water 2 Qtr 2015 Corrective Action Annual Monitoring

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Sample pH Log

SDG: RAE35

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #
7856932	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856933	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856934	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856935	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856936	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856937	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856938	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856939	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856940	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856941	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856942	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7856943	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030C, May 2003.

11996 VOCs- 25ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

May 01, 2015

Project: RAAP - Radford, VA - HWMU-5

Submittal Date: 04/22/2015
Group Number: 1555349
SDG: RAE35
State of Sample Origin: VA

Client Sample Description	Lancaster Labs (LL) #
5W8B Grab Groundwater	7856932
5W5B Grab Groundwater	7856933
5W7B Grab Groundwater	7856934
5W7B Matrix Spike Grab Groundwater	7856935
5W7B Matrix Spike Dup Grab Groundwater	7856936
5WC21 Grab Groundwater	7856937
5WDUP Grab Groundwater	7856938
5WC22 Grab Groundwater	7856939
5WC23 Grab Groundwater	7856940
5W12A Grab Groundwater	7856941
Trip Blank 1 Water	7856942
Trip Blank 2 Water	7856943

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Janet Frazier
ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Kathy Olsen

Respectfully Submitted,

Barbara Weyandt

Barbara A. Weyandt
Specialist

(717) 556-7264

Project Name: RAAP - Radford, VA - HWMU-5
LL Group #: 1555349

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: H151154AA (Sample number(s): 7856932-7856943 UNSPK: 7856934)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Chloroform

Sample Description: 5W8B Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856932
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 10:20 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAD8B SDG#: RAE35-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H151154AA	04/25/2015 21:55	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 21:55	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W5B Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856933
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 11:10 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

8AD5B SDG#: RAE35-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Acetone	67-64-1	12	3.0	10	1
11996	2-Butanone	78-93-3	N.D.	1.0	10	1
11996	Chloroform	67-66-3	1.2	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.	0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Ethyl ether	60-29-7	N.D.	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.	0.2	1.0	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 22:16	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 22:16	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856934
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/21/2015 09:50 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAD7B SDG#: RAE35-03BKG

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.	3.0	10	1
11996	2-Butanone	78-93-3	N.D.	1.0	10	1
11996	Chloroform	67-66-3	25	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.	0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Ethyl ether	60-29-7	N.D.	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.	0.2	1.0	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 22:38	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 22:38	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Matrix Spike Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856935
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/21/2015 09:50 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAD7B SDG#: RAE35-03MS

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	29		3.0	10	1
11996	2-Butanone	78-93-3	37		1.0	10	1
11996	Chloroform	67-66-3	28	E	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	4.4		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	4.5		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	4.6		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	4.7		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	4.8		0.8	1.0	1
11996	Ethyl ether	60-29-7	5.1	J	0.4	12	1
11996	Methylene Chloride	75-09-2	4.7		0.2	1.0	1
11996	Toluene	108-88-3	4.5		0.1	1.0	1
11996	Trichloroethene	79-01-6	4.9		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	4.7		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	14		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 22:59	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 22:59	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Matrix Spike Dup Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856936
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/21/2015 09:50 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAD7B SDG#: RAE35-03MSD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	35		3.0	10	1
11996	2-Butanone	78-93-3	44		1.0	10	1
11996	Chloroform	67-66-3	30	E	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	5.1		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	4.9		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	5.0		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	5.0		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	5.2		0.8	1.0	1
11996	Ethyl ether	60-29-7	5.6	J	0.4	12	1
11996	Methylene Chloride	75-09-2	5.0		0.2	1.0	1
11996	Toluene	108-88-3	5.0		0.1	1.0	1
11996	Trichloroethene	79-01-6	5.3		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	5.2		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	15		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 23:21	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 23:21	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC21 Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856937
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 12:25 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAC21 SDG#: RAE35-04

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Chloroform	67-66-3	1.1		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.8	1.0	1
11996	Ethyl ether	60-29-7	1.4	J	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Toluene	108-88-3	N.D.		0.1	1.0	1
11996	Trichloroethene	79-01-6	3.2		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/26/2015 00:03	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/26/2015 00:03	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WDUP Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856938
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 12:30 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RADDP SDG#: RAE35-05FD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Chloroform	67-66-3	1.0		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.8	1.0	1
11996	Ethyl ether	60-29-7	1.4	J	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Toluene	108-88-3	N.D.		0.1	1.0	1
11996	Trichloroethene	79-01-6	3.0		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/26/2015 00:25	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/26/2015 00:25	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC22 Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856939
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 13:25 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAC22 SDG#: RAE35-06

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Chloroform	67-66-3	0.6	J	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.8	1.0	1
11996	Ethyl ether	60-29-7	4.5	J	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Toluene	108-88-3	N.D.		0.1	1.0	1
11996	Trichloroethene	79-01-6	3.5		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/26/2015 00:46	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/26/2015 00:46	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC23 Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856940
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015 14:30 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAC23 SDG#: RAE35-07

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Chloroform	67-66-3	0.8	J	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.		0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.8	1.0	1
11996	Ethyl ether	60-29-7	11	J	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Toluene	108-88-3	N.D.		0.1	1.0	1
11996	Trichloroethene	79-01-6	4.6		0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.		0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.		0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/26/2015 01:08	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/26/2015 01:08	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W12A Grab Groundwater
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856941
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/21/2015 10:55 by KC

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RAD12 SDG#: RAE35-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H151154AA	04/26/2015 01:29	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/26/2015 01:29	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank 1 Water
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856942
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RADT1 SDG#: RAE35-09TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.	3.0	10	1
11996	2-Butanone	78-93-3	N.D.	1.0	10	1
11996	Chloroform	67-66-3	N.D.	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.	0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Ethyl ether	60-29-7	N.D.	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.	0.2	1.0	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 21:12	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 21:12	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank 2 Water
2 Qtr 2015 Corrective Action Annual Monitoring
RAAP - Radford, VA - HWMU-5

LL Sample # WW 7856943
LL Group # 1555349
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 04/20/2015

Submitted: 04/22/2015 09:20
Reported: 05/01/2015 10:55

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RADT2 SDG#: RAE35-10TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.	3.0	10	1
11996	2-Butanone	78-93-3	N.D.	1.0	10	1
11996	Chloroform	67-66-3	N.D.	0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.	0.3	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.	0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Ethyl ether	60-29-7	N.D.	0.4	12	1
11996	Methylene Chloride	75-09-2	N.D.	0.2	1.0	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" and "K" lists	SW-846 8260C	1	H151154AA	04/25/2015 21:33	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151154AA	04/25/2015 21:33	Kevin A Sposito	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555349
Reported: 05/01/2015 10:55

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H151154AA	Sample number(s): 7856932-7856943								
Acetone	N.D.	3.0	10	ug/l	94		66-132		
2-Butanone	N.D.	1.0	10	ug/l	110		75-128		
Chloroform	N.D.	0.1	1.0	ug/l	107		80-120		
Dichlorodifluoromethane	N.D.	0.3	1.0	ug/l	105		35-142		
1,2-Dichloroethane	N.D.	0.1	1.0	ug/l	106		80-125		
1,1-Dichloroethene	N.D.	0.4	1.0	ug/l	107		80-120		
cis-1,2-Dichloroethene	N.D.	0.1	1.0	ug/l	106		80-120		
trans-1,2-Dichloroethene	N.D.	0.8	1.0	ug/l	109		80-120		
Ethyl ether	N.D.	0.4	12	ug/l	115		65-132		
Methylene Chloride	N.D.	0.2	1.0	ug/l	106		80-120		
Toluene	N.D.	0.1	1.0	ug/l	98		80-120		
Trichloroethene	N.D.	0.2	1.0	ug/l	108		80-120		
Vinyl Chloride	N.D.	0.1	1.0	ug/l	100		59-124		
Xylene (Total)	N.D.	0.2	3.0	ug/l	97		80-120		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: H151154AA	Sample number(s): 7856932-7856943 UNSPK: 7856934								
Acetone	78	95	57-163	19	30				
2-Butanone	99	117	56-160	16	30				
Chloroform	65 (2)	99 (2)	86-136	6	30				
Dichlorodifluoromethane	88	101	28-136	14	30				
1,2-Dichloroethane	91	97	82-135	7	30				
1,1-Dichloroethene	93	99	86-132	7	30				
cis-1,2-Dichloroethene	93	99	82-129	6	30				
trans-1,2-Dichloroethene	96	103	88-127	8	30				
Ethyl ether	101	112	57-139	10	30				
Methylene Chloride	95	101	77-135	6	30				
Toluene	91	100	83-127	10	30				
Trichloroethene	98	105	85-131	7	30				
Vinyl Chloride	94	103	62-135	9	30				
Xylene (Total)	91	99	81-137	8	30				

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555349
Reported: 05/01/2015 10:55

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: RAAP Unit 5 "J" and "K" lists
Batch number: H151154AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7856932	103	106	95	94
7856933	103	105	96	92
7856934	104	105	95	92
7856935	101	105	96	96
7856936	101	103	98	97
7856937	101	104	96	92
7856938	101	107	97	91
7856939	101	105	97	93
7856940	101	105	96	92
7856941	102	105	96	91
7856942	105	105	94	93
7856943	103	106	95	93
Blank	104	106	93	94
LCS	102	103	95	99
MS	101	105	96	96
MSD	101	103	98	97
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

11200/1555349/7856932-43

CHAIN OF CUSTODY RECORD

Laboratory: Eurofins Lancaster Laboratories Environmental, LLC, 2425 New Holland Pike, Lancaster, PA, 17605-2425/ Barb Weyandt, Manager/ (717) 656-2300

Client:	Draper Aden Associates	**Consultant:**	Draper Aden Associates	**Sample Site:**	RFAAP, Radford, Virginia
Attn:	0	**Attn:**	Janet C. Frazier	**Location:**	HWMU5
Address:	0	**Address:**	2206 South Main Street	**Event:**	2 Qtr 2015 Corrective Action Annual Monitoring Event
	0		Blacksburg, Virginia 24060	**DAA JN:**	B03204-13
Phone:	0	**Phone:**	(540) 552-0444	**Lab JN:**	
Fax:	0	**Fax:**	(540) 552-0291		
Fax:	0				

Project Specific (PS) or Batch (B) QC:
Sample Collection for Project Complete? *YES*
UPS! **Carrier:** 1Z-75Y-02X-Y0-4234-2580
Tracking Number:

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: *YES*
Bill: *CLIENT* *OTHER*
Preserved and shipped on ice: *YES*

Box 4 - Sample Type					G							
Box 3 - Filtered/Unfiltered					U							
Required pH of Sample					<2							
Box 2 - Preservative					A							
Box 5 - Sample Container Type					3-40ml V							
Sample ID	**2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**8260C/5030C 25 ml purge Appendix J Analyte List**	**8260C/5030C 25 ml purge Appendix K Analyte List**						
5W8B	4/20	1020	GW	3	X							
5W5B	4/20	1110	GW	3	X	X						
5W7B	4/20	0950	GW	9	X	X						USE FOR QC
5WC21	4/20	1225	GW	3	X	X						
5WDUP	4/20	1230	GW	3	X	X						
5WC22	4/20	1325	GW	3	X	X						
5WC23	4/20	1430	GW	3	X	X						
5W12A	4/21	1055	GW	3	X							
Trip Blank 1	4/20	—	T	2	X	X						
Trip Blank 2	4/20	—	T	2	X	X						

GENERAL NOTES:
1. See attached analyte list.
2. Report permit required LOQ/MDL or lab MDL if higher than permit MDL. Report Results to MDL with "J" Flags.
3. VELAP accreditation required.
4. Analyze samples once, but report analytes as noted. See attached list.

JVR 4-7-15

Clients Special Instructions: level 1 with edd.

Received by lab in Good Condition X Yes ____ No Custody Seal Intact X Yes ____ No Temperature upon arrival 1.7°C Received on Ice X Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/20/15	#1 Relinquished by (Signature):	Date: 4/21/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1500	Company Name:	Time:	
Sampler Name (Print): Tyler Emery	Date: 4/20/15	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date: 4-22-15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0800	Company Name:	Time:	Company Name: ELLE	Time: 920	

JVR 4/7/15 1/3

G# 1555349

2/3

HWMU5 Appendix - J
Radford Facility Army Ammunition Plant
Groundwater Corrective Action Annual Monitoring Event
DAA JN: B03204-13

ANALYTICAL METHOD: 8260C/5030C
TYPE METHOD: GCMS
CLASS: VOLATILE

Appendix – J Target Analyte List

No.	ANALYTE	CAS RN	Required QL (µg/l)	Required MDL*
1.	Trichloroethene	79-01-6	1	0.177
2.	1,1-Dichloroethene	75-35-4	1	0.44
3.	Cis-1,2-Dichloroethene	156-59-2	1	0.1
4.	Trans-1,2-Dichloroethene	156-60-5	1	0.8
5.	Vinyl Chloride	75-01-4	1	0.1

Note: *Report current lab MDL if higher.

25 ml purge volume

.t:\environmental\bbg\databases\raap\sample event set up\semi-annual events\hwmu-5\hwmu5 - coc rev 2010\hwmu 5 - appendix j cap target analyte list - rev 2010.doc

GH 1555349

HWMU5 - Appendix K
Radford Facility Army Ammunition Plant
Groundwater Corrective Action Annual Monitoring Event
DAA JN: B03204-13

ANALYTICAL METHOD: 8260C/5030C
TYPE METHOD: GCMS
CLASS: VOLATILE

Appendix – K Target Analyte List

No.	ANALYTE	CAS RN	Required QL (µg/l)	Required MDL (µg/l)
1.	Acetone	67-64-1	10	3
2.	Chloroform (trichloromethane)	67-66-3	1	0.1
3.	2-butanone (methyl ethyl ketone - MEK)	78-93-3	10	1
4.	1,2-dichloroethane	107-06-2	1	0.147
5.	Methylene chloride (Dichloromethane)	75-09-2	1	0.182
6.	Toluene (methyl benzene)	108-88-3	1	0.1
7.	Xylenes (total)	1330-20-7	3	0.208
8.	Diethyl ether	60-29-7	12	0.39
9.	Dichlorodifluoromethane	75-71-8	1	0.28

Note.
2Q2010 is the first event under corrective action monitoring. Analyte list and monitoring wells sampled have changed from previous event.

Final Report must list the project required QLs and MDLs listed above. Report results between the project required QL and MDL as estimated value.

QLs and MDLs noted above reflect permit modification data Nov 5, 2009. JCF

25 ml purge volume

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 66498

Group Number(s): 1555349

Client: Draper Aden

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	04/22/2015 9:20
Number of Packages:	1	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 11:52 on 04/22/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

CompuChem
A Division Of
Liberty Analytical Corp.

5/8/2015

Abridged data package. Full deliverable available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP APPIX 2015 UNIT 5

WorkOrder: 1504088

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504088

Project: RAAP APPIX 2015 UNIT 5 **Sdg:** 1504088

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504088-01	5W7B	Water	04/21/2015 09:50	04/23/2015 14:10
1504088-02	5W5B	Water	04/20/2015 11:10	04/23/2015 14:10
1504088-03	5WC21	Water	04/20/2015 12:25	04/23/2015 14:10
1504088-04	5WDUP	Water	04/20/2015 12:30	04/23/2015 14:10
1504088-05	5WC22	Water	04/20/2015 13:25	04/23/2015 14:10
1504088-06	5WC23	Water	04/20/2015 14:30	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

Laboratory: COMPUCHEM

SDG: 1504088

Client Sample Id:	Analysis:	Lab Sample Id:
5W7B	SW8270D	1504088-01
5W5B	SW8270D	1504088-02
5WC21	SW8270D	1504088-03
5WDUP	SW8270D	1504088-04
5WC22	SW8270D	1504088-05
5WC23	SW8270D	1504088-06

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Quentisha Forrester

Name: Quentisha Forrester

Date: 04/28/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem

A division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # 1504088
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 5W7B 5W5B 5WC21 5WDUP 5WC22 5WC23

The 6 aqueous samples listed above were received intact, temperatures ranging from -0.4°C to 0.7°C, with proper documentation, in sealed shipping containers, on April 23, 2015. These samples were scheduled for the requested analyses of the semivolatile fraction only. SW-846, 3rd Edition, Update 3, Separatory Funnel extraction (Method 3510C), and Method 8270D were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the narrative deals with the semivolatile fraction.

Semivolatile

Extraction and analysis holding time requirements were met for these samples.

No Semivolatile project analytes identified were confirmed above the Quantitation Limit (QL) in these samples.

Manual integrations were performed in this SDG, as indicated on the detailed Manual Integration Summary report that is located in section S. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG.

All of the surrogates met recovery and retention time criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria.

5W7B was used as the original to prepare the duplicate matrix spikes as requested. The associated duplicate matrix spikes met all of the advisory accuracy criteria. Laboratory Control Samples (LCS/LCSD) were prepared and analyzed along with these samples and met all accuracy and precision criteria.

An uncertainty of these test results may be estimated from the recovery of the surrogates added to the sample prior to sample preparation or from the recovery of spiked compound(s) in the associated laboratory control sample. Further information is available upon request.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Furthermore, I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Quentisha Forrester
Chemist III
April 28, 2015

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

4/9/2015

Client: Draper Aden Associates **Attn:** 0 **Address:** 0 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU5 **Event:** 2Q 2015 GW Corrective Action Monitoring Event **DAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES **Carrier:** DASHCOURIER **Tracking Number:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G	G						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					<2	<2							
Box 2 - Preservative					B	B	H						
Box 5 - Sample Container Type					1-500ml P	1-500ml P	2-1L A						
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**(Metals-Total) 6020A(3005A)/ 7470A**	**Cobalt only-Total 6020A/3005A**	**8270D/3510C (Semivolatiles)**	**metals pH**					
5W8B	4/20	1020	GW	1		X					1504089-01		upgradient monitoring well
5W5B	4/20	1110	GW	3	X		X	<2			1504088-02		
5W7B	4/20	1155	GW	3	X		X	<2			-01		USE FOR QC
5WC21	4/20	1225	GW	3	X		X	<2			-03		
5WDUP	4/20	1230	GW	3	X		X	<2			-04		
5WC22	4/20	1325	GW	3	X		X	<2			-05		
5WC23	4/20	1430	GW	3	X		X	<2			-06		
5W12A	4/21	1055	GW	1		X					1504089-02		received 2 amber liters plume well for 5W12A/ not on COC @ 4/23/15

GENERAL NOTES:
1. Report results with 'J' or 'B' flag, (report estimated results).
2. ERIS required. VELAP Accreditation required
3. Project specific MDL/QL's attached.

4. Cobalt
QL = 5 ug/L MDL 1 ug/L
JWR 4/7/15

Clients Special Instructions: level 4 with edd.

0.7°C, -0.2°C, -0.4°C, -0.1°C

Cobalt only in cooler @ -0.2°C @ 4/23/15

metals 5WDUP in 0.7°C (16)
5WC23 in -0.4°C (16)

Received by lab in Good Condition ✓ Yes ___ No Custody Seal Intact ✓ Yes ___ No Temperature upon arrival ✓ Received on Ice ✓ Yes ___ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/20/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): Taylor	Date: 4/23/15	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1035	Company Name: Dash Courier	Time: 1410	
Sampler Name (Print): Tyler Emery	Date: 4/20/15	#1 Received by (Signature): Taylor	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0800	Company Name: DASH	Time: 10:30	Company Name: CompuChem	Time: 1410	

1/3 JWR 4.5.2015

HOLDING TIME SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
5W7B	04/21/15	04/23/15	04/27/15	6	7	04/27/15	0.4	40	
5W5B	04/20/15	04/23/15	04/27/15	7	7	04/27/15	0.5	40	
5WC21	04/20/15	04/23/15	04/27/15	7	7	04/27/15	0.5	40	
5WDUP	04/20/15	04/23/15	04/27/15	7	7	04/27/15	0.5	40	
5WC22	04/20/15	04/23/15	04/27/15	7	7	04/27/15	0.6	40	
5WC23	04/20/15	04/23/15	04/27/15	7	7	04/28/15	0.6	40	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
Blank (5042401-BLK1) ug/L Lab File ID: 5042401-BLK166.d Analyzed: 04/27/15 18:00				
2-Fluorophenol	100.0	69	33 - 110	
Phenol-d5	100.0	43	20 - 110	
Nitrobenzene-d5	50.00	91	45 - 110	
2-Fluorobiphenyl	50.00	83	46 - 110	
2,4,6-Tribromophenol	100.0	80	42 - 119	
Terphenyl-d14	50.00	92	59 - 110	
LCS (5042401-BS1) ug/L Lab File ID: 5042401-BS166.d Analyzed: 04/27/15 18:40				
2-Fluorophenol	100.0	73	33 - 110	
Phenol-d5	100.0	43	20 - 110	
Nitrobenzene-d5	50.00	97	45 - 110	
2-Fluorobiphenyl	50.00	88	46 - 110	
2,4,6-Tribromophenol	100.0	92	42 - 119	
Terphenyl-d14	50.00	92	59 - 110	
LCS Dup (5042401-BSD1) ug/L Lab File ID: 5042401-BSD166.d Analyzed: 04/27/15 19:19				
2-Fluorophenol	100.0	64	33 - 110	
Phenol-d5	100.0	40	20 - 110	
Nitrobenzene-d5	50.00	92	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
2,4,6-Tribromophenol	100.0	91	42 - 119	
Terphenyl-d14	50.00	93	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
5W7B (1504088-01) ug/L Lab File ID: 1504088-0166.d Analyzed: 04/27/15 19:59				
2-Fluorophenol	100.0	62	33 - 110	
Phenol-d5	100.0	36	20 - 110	
Nitrobenzene-d5	50.00	90	45 - 110	
2-Fluorobiphenyl	50.00	77	46 - 110	
2,4,6-Tribromophenol	100.0	76	42 - 119	
Terphenyl-d14	50.00	94	59 - 110	
Matrix Spike (5042401-MS1) ug/L Lab File ID: 5042401-MS166.d Analyzed: 04/27/15 20:39				
2-Fluorophenol	100.0	58	33 - 110	
Phenol-d5	100.0	35	20 - 110	
Nitrobenzene-d5	50.00	85	45 - 110	
2-Fluorobiphenyl	50.00	79	46 - 110	
2,4,6-Tribromophenol	100.0	88	42 - 119	
Terphenyl-d14	50.00	88	59 - 110	
Matrix Spike Dup (5042401-MSD1) ug/L Lab File ID: 5042401-MSD166.d Analyzed: 04/27/15 21:18				
2-Fluorophenol	100.0	62	33 - 110	
Phenol-d5	100.0	33	20 - 110	
Nitrobenzene-d5	50.00	85	45 - 110	
2-Fluorobiphenyl	50.00	81	46 - 110	
2,4,6-Tribromophenol	100.0	95	42 - 119	
Terphenyl-d14	50.00	89	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
5W5B (1504088-02) ug/L Lab File ID: 1504088-0266.d Analyzed: 04/27/15 21:58				
2-Fluorophenol	100.0	57	33 - 110	
Phenol-d5	100.0	34	20 - 110	
Nitrobenzene-d5	50.00	91	45 - 110	
2-Fluorobiphenyl	50.00	85	46 - 110	
2,4,6-Tribromophenol	100.0	81	42 - 119	
Terphenyl-d14	50.00	100	59 - 110	
5WC21 (1504088-03) ug/L Lab File ID: 1504088-0366.d Analyzed: 04/27/15 22:37				
2-Fluorophenol	100.0	58	33 - 110	
Phenol-d5	100.0	36	20 - 110	
Nitrobenzene-d5	50.00	87	45 - 110	
2-Fluorobiphenyl	50.00	79	46 - 110	
2,4,6-Tribromophenol	100.0	78	42 - 119	
Terphenyl-d14	50.00	93	59 - 110	
5WDUP (1504088-04) ug/L Lab File ID: 1504088-0466.d Analyzed: 04/27/15 23:16				
2-Fluorophenol	100.0	52	33 - 110	
Phenol-d5	100.0	32	20 - 110	
Nitrobenzene-d5	50.00	83	45 - 110	
2-Fluorobiphenyl	50.00	78	46 - 110	
2,4,6-Tribromophenol	100.0	72	42 - 119	
Terphenyl-d14	50.00	91	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2015 UNIT 5

SDG: 1504088 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
5WC22 (1504088-05) ug/L Lab File ID: 1504088-0566.d Analyzed: 04/27/15 23:56				
2-Fluorophenol	100.0	59	33 - 110	
Phenol-d5	100.0	36	20 - 110	
Nitrobenzene-d5	50.00	94	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
2,4,6-Tribromophenol	100.0	83	42 - 119	
Terphenyl-d14	50.00	104	59 - 110	
5WC23 (1504088-06) ug/L Lab File ID: 1504088-0666.d Analyzed: 04/28/15 00:35				
2-Fluorophenol	100.0	53	33 - 110	
Phenol-d5	100.0	32	20 - 110	
Nitrobenzene-d5	50.00	89	45 - 110	
2-Fluorobiphenyl	50.00	82	46 - 110	
2,4,6-Tribromophenol	100.0	78	42 - 119	
Terphenyl-d14	50.00	95	59 - 110	

LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042401-BS1 Matrix: Water Client ID: SLCSVI Batch: 5042401

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Nitrobenzene	40.00	39.4	99		59 - 100
2-Nitroaniline	40.00	34.4	86		67 - 110
2,6-Dinitrotoluene	40.00	38.9	97		66 - 117
2,4-Dinitrotoluene	40.00	37.7	94		58 - 123
Diethylphthalate	40.00	37.7	94		64 - 114
4-Nitroaniline	40.00	39.6	99		78 - 124
bis(2-ethylhexyl)Phthalate	40.00	41.9	105		75 - 114

LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042401-BSD1 Matrix: Water Client ID: SLCSDVI Batch: 5042401

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Nitrobenzene	40.00	36.3	91	8	30		59 - 100
2-Nitroaniline	40.00	34.3	86	0.2	30		67 - 110
2,6-Dinitrotoluene	40.00	39.4	98	1	30		66 - 117
2,4-Dinitrotoluene	40.00	38.3	96	1	30		58 - 123
Diethylphthalate	40.00	38.0	95	0.9	30		64 - 114
4-Nitroaniline	40.00	39.7	99	0.3	30		78 - 124
bis(2-ethylhexyl)Phthalate	40.00	43.7	109	4	30		75 - 114

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

5W7BMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042401-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Nitrobenzene	40.00	10 U	34.7	87		59 - 100
2-Nitroaniline	40.00	10 U	32.2	81		67 - 110
2,6-Dinitrotoluene	40.00	10 U	37.1	93		66 - 117
2,4-Dinitrotoluene	40.00	10 U	35.1	88		58 - 123
Diethylphthalate	40.00	10 U	35.5	89		64 - 114
4-Nitroaniline	40.00	20 U	36.7	92		78 - 124
bis(2-ethylhexyl)Phthalate	40.00	6.0 U	39.4	98		75 - 114

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

5W7BMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Lab ID: 5042401-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504088-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Nitrobenzene	40.00	35.0	88	0.9		30	59 - 100
2-Nitroaniline	40.00	33.7	84	4		30	67 - 110
2,6-Dinitrotoluene	40.00	40.2	101	8		30	66 - 117
2,4-Dinitrotoluene	40.00	37.7	94	7		30	58 - 123
Diethylphthalate	40.00	39.3	98	10		30	64 - 114
4-Nitroaniline	40.00	39.1	98	6		30	78 - 124
bis(2-ethylhexyl)Phthalate	40.00	40.3	101	2		30	75 - 114

PREPARATION BATCH SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Batch: 5042401 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
5W7B	1504088-01	04/27/15 10:23	1000	1000
5W5B	1504088-02	04/27/15 10:23	1000	1000
5WC21	1504088-03	04/27/15 10:23	1000	1000
5WDUP	1504088-04	04/27/15 10:23	1000	1000
5WC22	1504088-05	04/27/15 10:23	1000	1000
5WC23	1504088-06	04/27/15 10:23	1000	1000
SBLKVI	5042401-BLK1	04/27/15 10:23	1000	1000
SLCSVI	5042401-BS1	04/27/15 10:23	1000	1000
SLCSDVI	5042401-BSD1	04/27/15 10:23	1000	1000
5W7BMS	5042401-MS1	04/27/15 10:23	1000	1000
5W7BMSD	5042401-MSD1	04/27/15 10:23	1000	1000

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D06001 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCS	5D06001-TUN1	5D06001-TUN166.d	04/06/15 12:01:00
SSTD060CS	5D06001-CAL6	5D06001-CAL666.d	04/06/15 12:22:00
SSTD050CS	5D06001-CAL5	5D06001-CAL566.d	04/06/15 13:02:00
SSTD040CS	5D06001-CAL4	5D06001-CAL466.d	04/06/15 13:41:00
SSTD025CS	5D06001-CAL3	5D06001-CAL366.d	04/06/15 14:21:00
SSTD010CS	5D06001-CAL2	5D06001-CAL266.d	04/06/15 15:00:00
SSTD005CS	5D06001-CAL1	5D06001-CAL166.d	04/06/15 15:39:00
SCV025VAL1CS	5D06001-SCV1	5D06001-SCV166.d	04/06/15 16:20:00

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCY	5D27004-TUN1	5D27004-TUN166.d	04/27/15 16:59:00
SSTD025CY	5D27004-ICV1	5D27004-ICV166.d	04/27/15 17:21:00
SBLKVI	5042401-BLK1	5042401-BLK166.d	04/27/15 18:00:00
SLCSVI	5042401-BS1	5042401-BS166.d	04/27/15 18:40:00
SLCSDVI	5042401-BSD1	5042401-BSD166.d	04/27/15 19:19:00
5W7B	1504088-01	1504088-0166.d	04/27/15 19:59:00
5W7BMS	5042401-MS1	5042401-MS166.d	04/27/15 20:39:00
5W7BMSD	5042401-MSD1	5042401-MSD166.d	04/27/15 21:18:00
5W5B	1504088-02	1504088-0266.d	04/27/15 21:58:00
5WC21	1504088-03	1504088-0366.d	04/27/15 22:37:00
5WDUP	1504088-04	1504088-0466.d	04/27/15 23:16:00
5WC22	1504088-05	1504088-0566.d	04/27/15 23:56:00
5WC23	1504088-06	1504088-0666.d	04/28/15 00:35:00

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504088
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2015 UNIT 5
Lab File ID:	5D06001-TUN166.d	Injection Date:	04/06/15
Instrument ID:	5972hp66	Injection Time:	12:01
Sequence:	5D06001	Lab Sample ID:	5D06001-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	47.2	PASS
68	Less than 2% of 69	0	PASS
69	Present	60.5	PASS
70	Less than 2% of 69	0.0249	PASS
127	10 - 80% of 198	46.3	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.41	PASS
275	10 - 60% of 198	20.1	PASS
365	Greater than 1% of 198	2.59	PASS
441	Less than 100% of 443	79.4	PASS
442	50 - 100% of 198	68.3	PASS
443	15 - 24% of 442	19.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504088
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2015 UNIT 5
Lab File ID:	5D27004-TUN166.d	Injection Date:	04/27/15
Instrument ID:	5972hp66	Injection Time:	16:59
Sequence:	5D27004	Lab Sample ID:	5D27004-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	46.6	PASS
68	Less than 2% of 69	0	PASS
69	Present	58.8	PASS
70	Less than 2% of 69	0.18	PASS
127	10 - 80% of 198	44.4	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.91	PASS
275	10 - 60% of 198	20.4	PASS
365	Greater than 1% of 198	2.9	PASS
441	Less than 100% of 443	83.1	PASS
442	50 - 100% of 198	75.3	PASS
443	15 - 24% of 442	18.8	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory:	COMPUCHEM	SDG:	1504088
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2015 UNIT 5
Sequence:	5D06001	Instrument:	5972hp66
		Calibration:	5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D06001-SCV1)			Lab File ID: 5D06001-SCV166.d		Analyzed: 04/06/15 16:20				
1,4-Dichlorobenzene-d4	148982	7.786	143668	7.788	104	50 - 200	-0.0020	+/-0.50	
Naphthalene-d8	535830	10.617	541824	10.619	99	50 - 200	-0.0020	+/-0.50	
Acenaphthene-d10	306223	14.675	329077	14.677	93	50 - 200	-0.0020	+/-0.50	
Phenanthrene-d10	555068	17.516	592711	17.518	94	50 - 200	-0.0020	+/-0.50	
Chrysene-d12	654684	21.87	707222	21.872	93	50 - 200	-0.0020	+/-0.50	
Perylene-d12	464008	23.965	500476	23.957	93	50 - 200	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
Client: DRAPER ADEN ASSOCIATES
Sequence: 5D27004
SDG: 1504088
Project: RAAP APPIX 2015 UNIT 5
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D27004-ICV1)			Lab File ID: 5D27004-ICV166.d			Analyzed: 04/27/15 17:21			
1,4-Dichlorobenzene-d4	157876	7.745	143668	7.788	110	50 - 200	-0.0430	+/-0.50	
Naphthalene-d8	524949	10.576	541824	10.619	97	50 - 200	-0.0430	+/-0.50	
Acenaphthene-d10	287803	14.634	329077	14.677	87	50 - 200	-0.0430	+/-0.50	
Phenanthrene-d10	521912	17.475	592711	17.518	88	50 - 200	-0.0430	+/-0.50	
Chrysene-d12	591195	21.829	707222	21.872	84	50 - 200	-0.0430	+/-0.50	
Perylene-d12	430117	23.914	500476	23.957	86	50 - 200	-0.0430	+/-0.50	
Blank (5042401-BLK1)			Lab File ID: 5042401-BLK166.d			Analyzed: 04/27/15 18:00			
1,4-Dichlorobenzene-d4	208577	7.75	157876	7.745	132	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	821622	10.581	524949	10.576	157	50 - 200	0.0050	+/-0.50	
Acenaphthene-d10	480273	14.629	287803	14.634	167	50 - 200	-0.0050	+/-0.50	
Phenanthrene-d10	820635	17.48	521912	17.475	157	50 - 200	0.0050	+/-0.50	
Chrysene-d12	919282	21.824	591195	21.829	155	50 - 200	-0.0050	+/-0.50	
Perylene-d12	609019	23.919	430117	23.914	142	50 - 200	0.0050	+/-0.50	
LCS (5042401-BS1)			Lab File ID: 5042401-BS166.d			Analyzed: 04/27/15 18:40			
1,4-Dichlorobenzene-d4	145274	7.755	157876	7.745	92	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	524301	10.586	524949	10.576	100	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	280464	14.634	287803	14.634	97	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	498037	17.485	521912	17.475	95	50 - 200	0.0100	+/-0.50	
Chrysene-d12	554013	21.829	591195	21.829	94	50 - 200	0.0000	+/-0.50	
Perylene-d12	398711	23.914	430117	23.914	93	50 - 200	0.0000	+/-0.50	
LCS Dup (5042401-BSD1)			Lab File ID: 5042401-BSD166.d			Analyzed: 04/27/15 19:19			
1,4-Dichlorobenzene-d4	208045	7.754	157876	7.745	132	50 - 200	0.0090	+/-0.50	
Naphthalene-d8	787236	10.585	524949	10.576	150	50 - 200	0.0090	+/-0.50	
Acenaphthene-d10	433691	14.643	287803	14.634	151	50 - 200	0.0090	+/-0.50	
Phenanthrene-d10	771086	17.484	521912	17.475	148	50 - 200	0.0090	+/-0.50	
Chrysene-d12	854162	21.828	591195	21.829	144	50 - 200	-0.0010	+/-0.50	
Perylene-d12	635669	23.913	430117	23.914	148	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504088
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2015 UNIT 5
Sequence: 5D27004
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
5W7B (1504088-01)			Lab File ID: 1504088-0166.d			Analyzed: 04/27/15 19:59			
1,4-Dichlorobenzene-d4	206201	7.755	157876	7.745	131	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	777170	10.576	524949	10.576	148	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	447056	14.634	287803	14.634	155	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	754480	17.475	521912	17.475	145	50 - 200	0.0000	+/-0.50	
Chrysene-d12	855428	21.819	591195	21.829	145	50 - 200	-0.0100	+/-0.50	
Perylene-d12	578016	23.914	430117	23.914	134	50 - 200	0.0000	+/-0.50	
Matrix Spike (5042401-MS1)			Lab File ID: 5042401-MS166.d			Analyzed: 04/27/15 20:39			
1,4-Dichlorobenzene-d4	130681	7.748	157876	7.745	83	50 - 200	0.0030	+/-0.50	
Naphthalene-d8	478606	10.58	524949	10.576	91	50 - 200	0.0040	+/-0.50	
Acenaphthene-d10	268267	14.627	287803	14.634	93	50 - 200	-0.0070	+/-0.50	
Phenanthrene-d10	467605	17.479	521912	17.475	90	50 - 200	0.0040	+/-0.50	
Chrysene-d12	564412	21.822	591195	21.829	95	50 - 200	-0.0070	+/-0.50	
Perylene-d12	398297	23.918	430117	23.914	93	50 - 200	0.0040	+/-0.50	
Matrix Spike Dup (5042401-MSD1)			Lab File ID: 5042401-MSD166.d			Analyzed: 04/27/15 21:18			
1,4-Dichlorobenzene-d4	120561	7.739	157876	7.745	76	50 - 200	-0.0060	+/-0.50	
Naphthalene-d8	404913	10.57	524949	10.576	77	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	214794	14.628	287803	14.634	75	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	406890	17.469	521912	17.475	78	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	468091	21.823	591195	21.829	79	50 - 200	-0.0060	+/-0.50	
Perylene-d12	326143	23.908	430117	23.914	76	50 - 200	-0.0060	+/-0.50	
5W5B (1504088-02)			Lab File ID: 1504088-0266.d			Analyzed: 04/27/15 21:58			
1,4-Dichlorobenzene-d4	185565	7.738	157876	7.745	118	50 - 200	-0.0070	+/-0.50	
Naphthalene-d8	649413	10.559	524949	10.576	124	50 - 200	-0.0170	+/-0.50	
Acenaphthene-d10	354154	14.627	287803	14.634	123	50 - 200	-0.0070	+/-0.50	
Phenanthrene-d10	614733	17.468	521912	17.475	118	50 - 200	-0.0070	+/-0.50	
Chrysene-d12	676367	21.822	591195	21.829	114	50 - 200	-0.0070	+/-0.50	
Perylene-d12	468156	23.907	430117	23.914	109	50 - 200	-0.0070	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504088
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2015 UNIT 5
Sequence: 5D27004
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
5WC21 (1504088-03)			Lab File ID: 1504088-0366.d			Analyzed: 04/27/15 22:37			
1,4-Dichlorobenzene-d4	232083	7.734	157876	7.745	147	50 - 200	-0.0110	+/-0.50	
Naphthalene-d8	895182	10.565	524949	10.576	171	50 - 200	-0.0110	+/-0.50	
Acenaphthene-d10	498940	14.622	287803	14.634	173	50 - 200	-0.0120	+/-0.50	
Phenanthrene-d10	861117	17.474	521912	17.475	165	50 - 200	-0.0010	+/-0.50	
Chrysene-d12	985917	21.818	591195	21.829	167	50 - 200	-0.0110	+/-0.50	
Perylene-d12	671579	23.913	430117	23.914	156	50 - 200	-0.0010	+/-0.50	
5WDUP (1504088-04)			Lab File ID: 1504088-0466.d			Analyzed: 04/27/15 23:16			
1,4-Dichlorobenzene-d4	189746	7.739	157876	7.745	120	50 - 200	-0.0060	+/-0.50	
Naphthalene-d8	693005	10.57	524949	10.576	132	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	384372	14.627	287803	14.634	134	50 - 200	-0.0070	+/-0.50	
Phenanthrene-d10	650517	17.469	521912	17.475	125	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	721838	21.823	591195	21.829	122	50 - 200	-0.0060	+/-0.50	
Perylene-d12	473024	23.908	430117	23.914	110	50 - 200	-0.0060	+/-0.50	
5WC22 (1504088-05)			Lab File ID: 1504088-0566.d			Analyzed: 04/27/15 23:56			
1,4-Dichlorobenzene-d4	177143	7.732	157876	7.745	112	50 - 200	-0.0130	+/-0.50	
Naphthalene-d8	683120	10.563	524949	10.576	130	50 - 200	-0.0130	+/-0.50	
Acenaphthene-d10	380267	14.621	287803	14.634	132	50 - 200	-0.0130	+/-0.50	
Phenanthrene-d10	664997	17.472	521912	17.475	127	50 - 200	-0.0030	+/-0.50	
Chrysene-d12	732895	21.816	591195	21.829	124	50 - 200	-0.0130	+/-0.50	
Perylene-d12	472654	23.911	430117	23.914	110	50 - 200	-0.0030	+/-0.50	
5WC23 (1504088-06)			Lab File ID: 1504088-0666.d			Analyzed: 04/28/15 00:35			
1,4-Dichlorobenzene-d4	224655	7.731	157876	7.745	142	50 - 200	-0.0140	+/-0.50	
Naphthalene-d8	805350	10.562	524949	10.576	153	50 - 200	-0.0140	+/-0.50	
Acenaphthene-d10	452077	14.63	287803	14.634	157	50 - 200	-0.0040	+/-0.50	
Phenanthrene-d10	780986	17.471	521912	17.475	150	50 - 200	-0.0040	+/-0.50	
Chrysene-d12	882432	21.815	591195	21.829	149	50 - 200	-0.0140	+/-0.50	
Perylene-d12	612140	23.91	430117	23.914	142	50 - 200	-0.0040	+/-0.50	

K. Target Compound Results

(ANALYSIS DATA SHEETS)

Analysis Data Sheets (ADS), Tentatively Identified Compounds (TICs), and Surrogate Recovery Results

Sample data shall be arranged in packets with the Analysis Data Sheet, followed by the raw data for volatile or semivolatile samples. These sample packets shall be placed in increasing Client Sample ID number order, considering both letters and numbers.

a. Target Analyte Results (ANALYSIS DATA SHEET)

Tabulated results (identification and quantitation) and Tentatively Identified Compounds (TICs) shall be included.

b. Reconstructed Ion Chromatograms (RICs)

Include for each sample or sample extract, including dilutions and reanalyses. The RIC shall contain the following header information: Client Sample ID Number, date and time of analysis, instrument ID, Lab file ID, and analyst ID.

d. Quantitation Report for target analytes and TICs.

Include a printout of the Extracted Ion Current Profile (EICP) for all manual changes to all compounds, internal standards, and surrogate compounds.

e. Copies of raw spectra and copies of background-subtracted mass spectra of target analytes plus TICs identified in the sample.

- The spectra shall include the following information: Client Sample ID number, Lab file ID, date and time of analysis, and instrument ID.
- The compound name must be clearly marked.

ANALYSIS DATA SHEET

SW8270D

5W5B

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0266.d Sampled: 04/20/15 11:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 21:58

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	10	*U*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	56.96	57	33 - 110	
Phenol-d5	100.0	34.24	34	20 - 110	
Nitrobenzene-d5	50.00	45.50	91	45 - 110	
2-Fluorobiphenyl	50.00	42.25	85	46 - 110	
2,4,6-Tribromophenol	100.0	80.54	81	42 - 119	
Terphenyl-d14	50.00	50.19	100	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

5W7B

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0166.d Sampled: 04/21/15 09:50

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 19:59

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	10	*U*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	61.62	62	33 - 110	
Phenol-d5	100.0	36.35	36	20 - 110	
Nitrobenzene-d5	50.00	44.79	90	45 - 110	
2-Fluorobiphenyl	50.00	38.44	77	46 - 110	
2,4,6-Tribromophenol	100.0	76.39	76	42 - 119	
Terphenyl-d14	50.00	46.77	94	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

5WC21

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0366.d Sampled: 04/20/15 12:25

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 22:37

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene	3.0	0.84	10	*J*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	58.00	58	33 - 110	
Phenol-d5	100.0	36.06	36	20 - 110	
Nitrobenzene-d5	50.00	43.54	87	45 - 110	
2-Fluorobiphenyl	50.00	39.52	79	46 - 110	
2,4,6-Tribromophenol	100.0	78.49	78	42 - 119	
Terphenyl-d14	50.00	46.30	93	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

5WC22

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0566.d Sampled: 04/20/15 13:25

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 23:56

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene	2.8	0.84	10	*J*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	59.23	59	33 - 110	
Phenol-d5	100.0	36.09	36	20 - 110	
Nitrobenzene-d5	50.00	46.96	94	45 - 110	
2-Fluorobiphenyl	50.00	43.13	86	46 - 110	
2,4,6-Tribromophenol	100.0	83.39	83	42 - 119	
Terphenyl-d14	50.00	52.18	104	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

5WC23

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0666.d Sampled: 04/20/15 14:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 00:35

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene	2.8	0.84	10	*J*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	53.35	53	33 - 110	
Phenol-d5	100.0	32.41	32	20 - 110	
Nitrobenzene-d5	50.00	44.33	89	45 - 110	
2-Fluorobiphenyl	50.00	41.14	82	46 - 110	
2,4,6-Tribromophenol	100.0	78.16	78	42 - 119	
Terphenyl-d14	50.00	47.32	95	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

5WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504088-0466.d Sampled: 04/20/15 12:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504088-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 23:16

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
606-20-2	2,6-Dinitrotoluene		0.75	10	*U*
121-14-2	2,4-Dinitrotoluene	2.9	0.84	10	*J*
84-66-2	Diethylphthalate		0.52	10	*U*
100-01-6	4-Nitroaniline		2.7	20	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	51.95	52	33 - 110	
Phenol-d5	100.0	32.35	32	20 - 110	
Nitrobenzene-d5	50.00	41.27	83	45 - 110	
2-Fluorobiphenyl	50.00	39.13	78	46 - 110	
2,4,6-Tribromophenol	100.0	72.39	72	42 - 119	
Terphenyl-d14	50.00	45.56	91	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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INITIAL CALIBRATION DATA

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Nitrobenzene	5	0.3810878	10	0.4117267	25	0.4077737	40	0.3936675	50	0.4130857	60	0.4040921
2-Nitroaniline	5	0.418611	10	0.43264	25	0.4729203	40	0.4798373	50	0.5246099	60	0.5011019
2,6-Dinitrotoluene	5	0.2530117	10	0.3038136	25	0.3125104	40	0.3064479	50	0.3584601	60	0.3314056
2,4-Dinitrotoluene	5	0.3047905	10	0.3694067	25	0.4262929	40	0.4351384	50	0.4650856	60	0.4583921
Diethylphthalate	5	1.415875	10	1.487223	25	1.469259	40	1.465198	50	1.587364	60	1.469072
4-Nitroaniline	5	0.2641569	10	0.3136442	25	0.3528828	40	0.3405723	50	0.3892725	60	0.3733431
bis(2-ethylhexyl)Phthalate	5	0.5675528	10	0.6970205	25	0.764793	40	0.7631767	50	0.7718619	60	0.8291579
2-Fluorophenol	5	1.043738	10	1.081313	25	1.209589	40	1.243145	50	1.249705	60	1.236287
Phenol-d5	5	1.41934	10	1.403164	25	1.515065	40	1.530975	50	1.49116	60	1.490777
Nitrobenzene-d5	5	0.3356	10	0.3676778	25	0.3786647	40	0.3849323	50	0.3961878	60	0.3869809
2-Fluorobiphenyl	5	1.301265	10	1.282714	25	1.263109	40	1.287132	50	1.296097	60	1.261813
2,4,6-Tribromophenol	5	0.2545751	10	0.2891611	25	0.3230004	40	0.3301011	50	0.3613092	60	0.3435551
Terphenyl-d14	5	0.677909	10	0.7315459	25	0.7554064	40	0.7386834	50	0.7516484	60	0.7314786

INITIAL CALIBRATION DATA (Continued)

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
Nitrobenzene	0.4019056	3.071451	9.055	3.489821E-02			CCC (20)	
2-Nitroaniline	0.4716201	8.521458	13.71933	4.782135E-02			CCC (20)	
2,6-Dinitrotoluene	0.3109416	11.23877	14.34967	6.058479E-02			CCC (20)	
2,4-Dinitrotoluene	0.409851	15.0368	15.203	3.776314E-02	0.9987893		CCC (20)	
Diethylphthalate	1.482332	3.82959	15.82133	5.393093E-02			CCC (20)	
4-Nitroaniline	0.3389786	13.28918	15.9235	8.763246E-02			CCC (20)	
bis(2-ethylhexyl)Phthalate	0.7322605	12.41783	22.1615	1.665501E-02			CCC (20)	
2-Fluorophenol	1.177296	7.705965	5.157667	7.087591E-02			CCC (20)	
Phenol-d5	1.47508	3.523541	7.224	6.731201E-02			CCC (20)	
Nitrobenzene-d5	0.3750073	5.732318	9.014167	3.855882E-02			CCC (20)	
2-Fluorobiphenyl	1.282022	1.286947	13.24567	2.624517E-02			CCC (20)	
2,4,6-Tribromophenol	0.3169503	12.25855	16.28817	3.609925E-02			CCC (20)	
Terphenyl-d14	0.731112	3.820085	20.27933	0.016046			CCC (20)	

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Nitrobenzene	25.00	24.7	-1.1	30.00
2-Nitroaniline	25.00	24.7	-1.3	30.00
2,6-Dinitrotoluene	25.00	25.0	-0.1	30.00
2,4-Dinitrotoluene	25.00	24.9	-0.2	30.00
Diethylphthalate	25.00	25.1	0.4	30.00
4-Nitroaniline	25.00	25.7	2.8	30.00
bis(2-ethylhexyl)Phthalate	25.00	25.7	3.0	30.00

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504088

Project: RAAP APPIX 2015 UNIT 5

Instrument ID: 5972hp66 Calibration: 5040707

Lab File ID: 5D27004-ICV166.d Calibration Date: 04/06/15 12:01

Sequence: 5D27004 Injection Date: 04/27/15

Lab Sample ID: 5D27004-ICV1 Injection Time: 17:21

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
Nitrobenzene	Avg	25.00	24.0	0.4019056	0.3825332	0.2	-4.8	20
2-Nitroaniline	Avg	25.00	27.0	0.4716201	0.5047119	0.01	7.0	20
2,6-Dinitrotoluene	Avg	25.00	25.5	0.3109416	0.3155381	0.2	1.5	20
2,4-Dinitrotoluene	Lin	25.00	24.5	0.409851	0.4202458	0.2	-2.0	20
Diethylphthalate	Avg	25.00	25.5	1.482332	1.508754	0.01	1.8	20
4-Nitroaniline	Avg	25.00	25.0	0.3389786	0.3420618	0.01	0.9	20
bis(2-ethylhexyl)Phthalate	Avg	25.00	27.0	0.7322605	0.7844681	0.01	7.1	20
2-Fluorophenol	Avg	25.00	25.00	1.177296	1.172637	0.05	-0.4	20
Phenol-d5	Avg	25.00	24.50	1.47508	1.459267	0.05	-1.1	20
Nitrobenzene-d5	Avg	25.00	26.00	0.3750073	0.3918735	0.05	4.5	20
2-Fluorobiphenyl	Avg	25.00	25.00	1.282022	1.291809	0.05	0.8	20
2,4,6-Tribromophenol	Avg	25.00	24.00	0.3169503	0.3048307	0.05	-3.8	20
Terphenyl-d14	Avg	25.00	25.00	0.731112	0.7259737	0.05	-0.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Data File: /chem/5972hp66.i/D5D06001A66.b/5D06001-TUN166.d

Date : 06-APR-2015 12:01

Client ID: DFTPPCS

Instrument: 5972hp66.i

Sample Info: 5D06001-TUN1:OWS

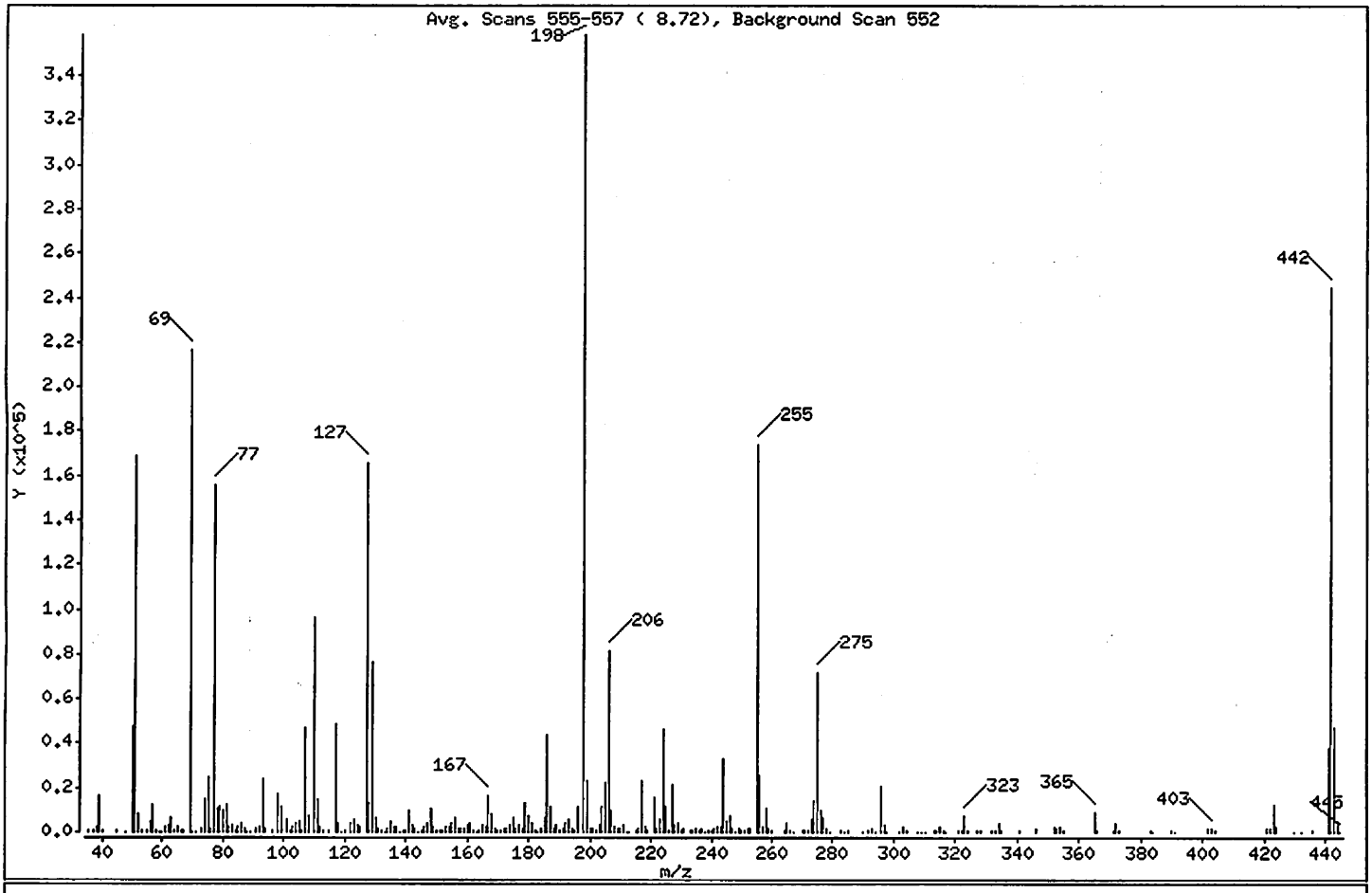
Volume Injected (uL): 2.0

Operator: OWS

Column phase: RTX-5MS

Column diameter: 0.32

1 Decafluorotriphenylphosphine



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	10.00 - 80.00% of mass 198	47.23
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	60.48
70	Less than 2.00% of mass 69	0.02 (0.02)
127	10.00 - 80.00% of mass 198	46.31
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.41
275	10.00 - 60.00% of mass 198	20.09
365	Greater than 1.00% of mass 198	2.59
441	Present, but less than mass 443	10.47
442	50.00 - 100.00% of mass 198	68.34
443	15.00 - 24.00% of mass 442	13.20 (19.31)

Rakdu Ham 4/7/2015

DFTPP TUNE/TAILING FACTOR/DEGRADATION SUMMARY RESULTS

DECAFLUOROTRIPHENYLPHOSPHINE Ion Abundance/Ratio Criteria Chart

Ion	Abundance Criteria	Base Peak	Other	Test
198	Base Peak, 100% relative abundance	100.00		PASS
51	10 - 80% of mass 198	47.23		PASS
68	Less than 2% of mass 69	0.00	(0.00)	PASS
69	Mass 69 relative abundance	60.48		PASS
70	Less than 2% of mass 69	0.02	(0.02)	PASS
127	10 - 80% of mass 198	46.31		PASS
197	Less than 2% of mass 198	0.00	(0.00)	PASS
199	5 - 9% of mass 198	6.41		PASS
275	10 - 60% of mass 198	20.09		PASS
365	Greater than 1% of mass 198	2.59		PASS
441	Present, but less than mass 443	10.47	(79.35)	PASS
442	50 - 100% of mass 198	68.34		PASS
443	15 - 24% of mass 442	13.20	(19.31)	PASS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	1.21	2.0	PASS
Benzidine	0.77	2.0	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	922028			N/A
4,4-DDE	423	0.0	20.0	PASS
4,4-DDD	4867	0.5	20.0	PASS
4,4-DDD + DDE	5290	0.6	20.0	PASS

Tuning Sample, /chem/5972hp66.i/D5D06001A66.b/5D06001-TUN166.d/5D06001-TUN166.d,

Data File: /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d

Date : 27-APR-2015 16:59

Client ID: DFTPPCY

Instrument: 5972hp66.i

Sample Info: 5D27004-TUN1:OWS

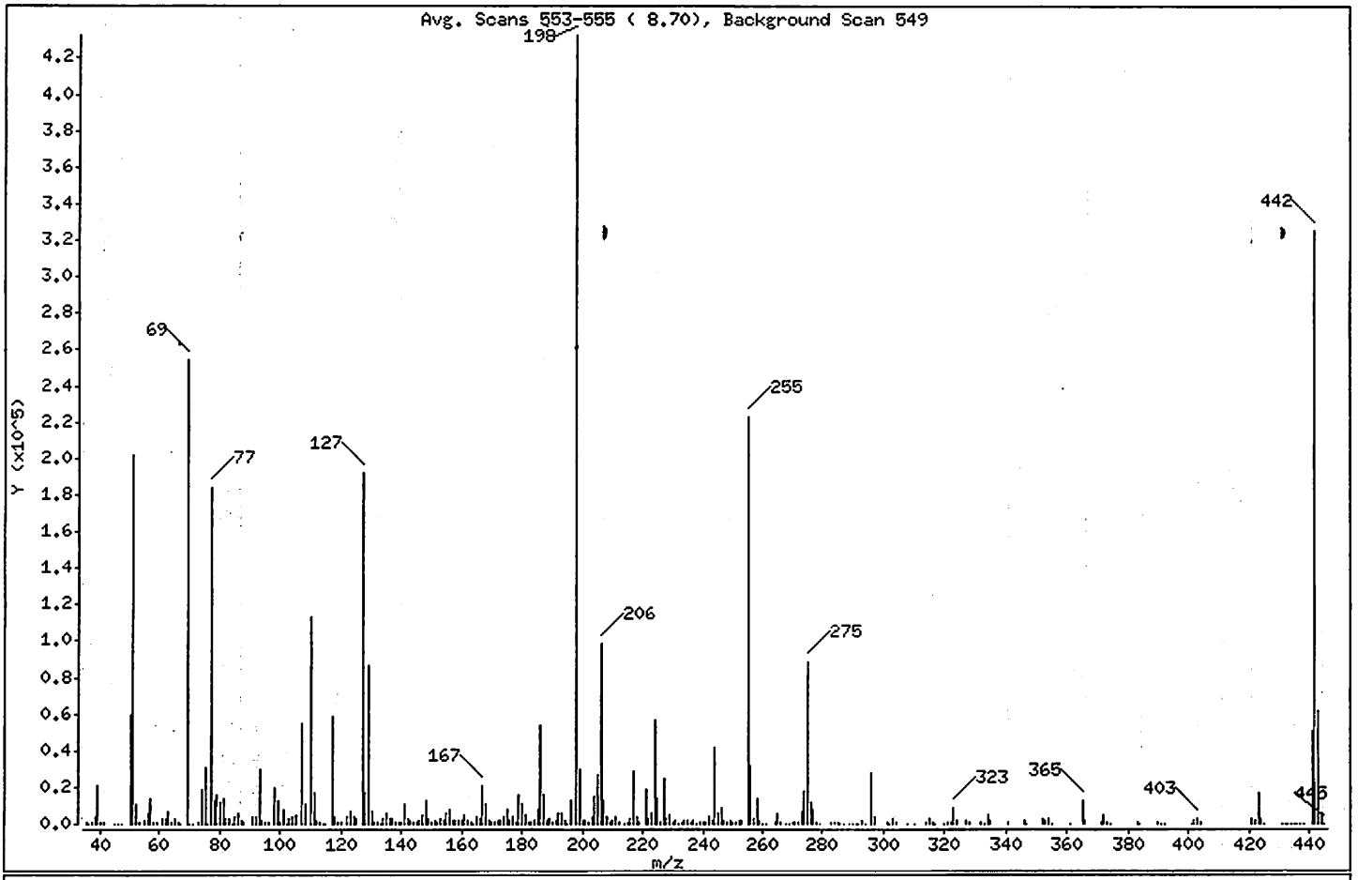
Volume Injected (uL): 2.0

Operator: OWS

Column phase: RTX-5MS

Column diameter: 0.32

1 Decafluorotriphenylphosphine



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	10.00 - 80.00% of mass 198	46.58
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	58.82
70	Less than 2.00% of mass 69	0.11 (0.18)
127	10.00 - 80.00% of mass 198	44.42
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.91
275	10.00 - 60.00% of mass 198	20.45
365	Greater than 1.00% of mass 198	2.90
441	Present, but less than mass 443	11.76
442	50.00 - 100.00% of mass 198	75.28
443	15.00 - 24.00% of mass 442	14.16 (18.81)

Rakdu Ham 4/28/2015

DFTPP TUNE/TAILING FACTOR/DEGRADATION SUMMARY RESULTS

DECAFLUOROTRIPHENYLPHOSPHINE Ion Abundance/Ratio Criteria Chart

Ion	Abundance Criteria	Base Peak	Other	Test
198	Base Peak, 100% relative abundance	100.00		PASS
51	10 - 80% of mass 198	46.58		PASS
68	Less than 2% of mass 69	0.00	(0.00)	PASS
69	Mass 69 relative abundance	58.82		PASS
70	Less than 2% of mass 69	0.11	(0.18)	PASS
127	10 - 80% of mass 198	44.42		PASS
197	Less than 2% of mass 198	0.00	(0.00)	PASS
199	5 - 9% of mass 198	6.91		PASS
275	10 - 60% of mass 198	20.45		PASS
365	Greater than 1% of mass 198	2.90		PASS
441	Present, but less than mass 443	11.76	(83.08)	PASS
442	50 - 100% of mass 198	75.28		PASS
443	15 - 24% of mass 442	14.16	(18.81)	PASS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	0.50	2.0	PASS
Benzidine	1.03	2.0	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

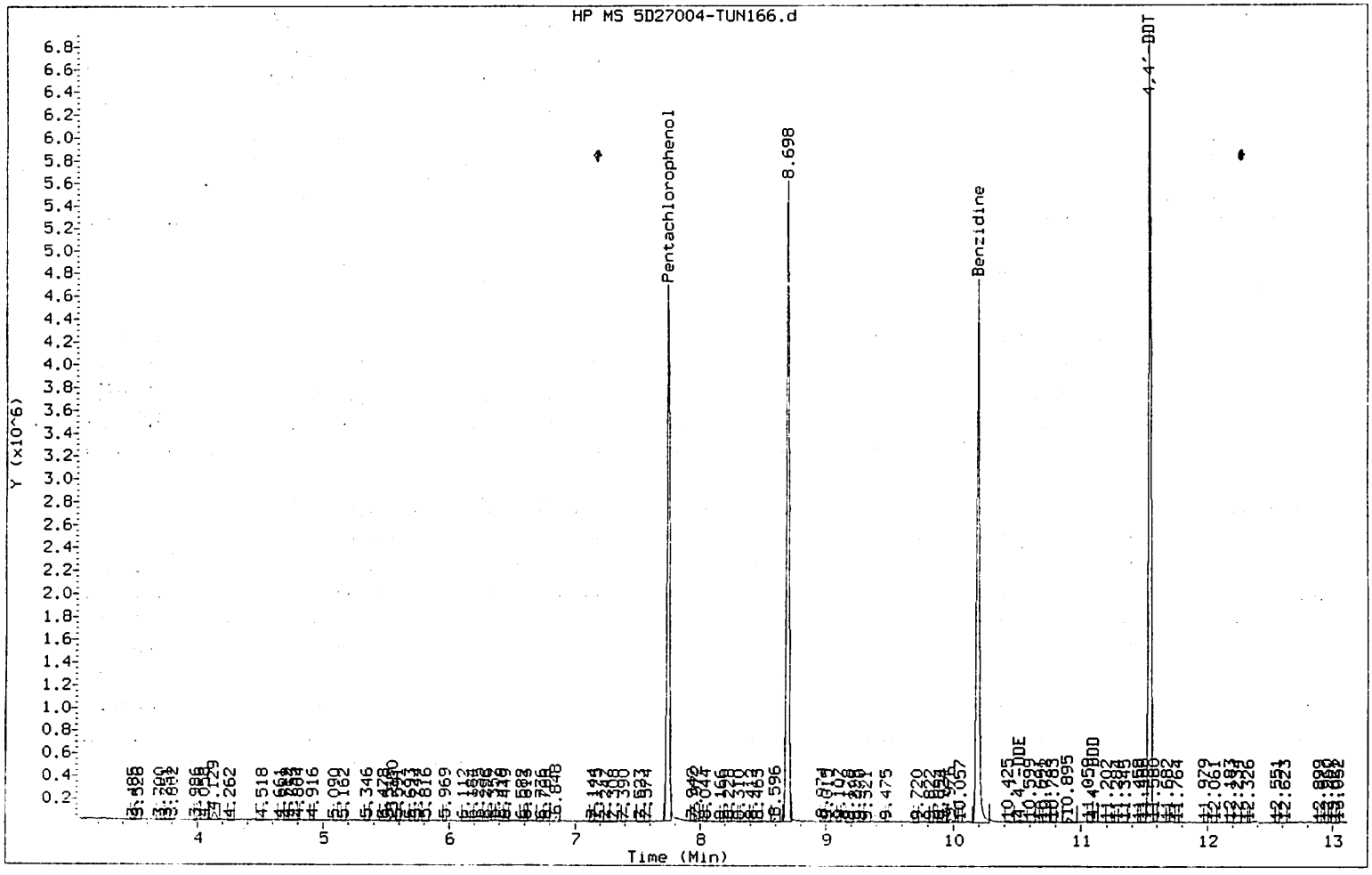
Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	1527033			N/A
4,4-DDE	716	0.0	20.0	PASS
4,4-DDD	3405	0.2	20.0	PASS
4,4-DDD + DDE	4121	0.3	20.0	PASS

Tuning Sample, /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d/5D27004-TUN166.d,

DFTPP TUNE/TAILING FACTOR/DEGRADATION SAMPLE AND GRAPHIC REPORT

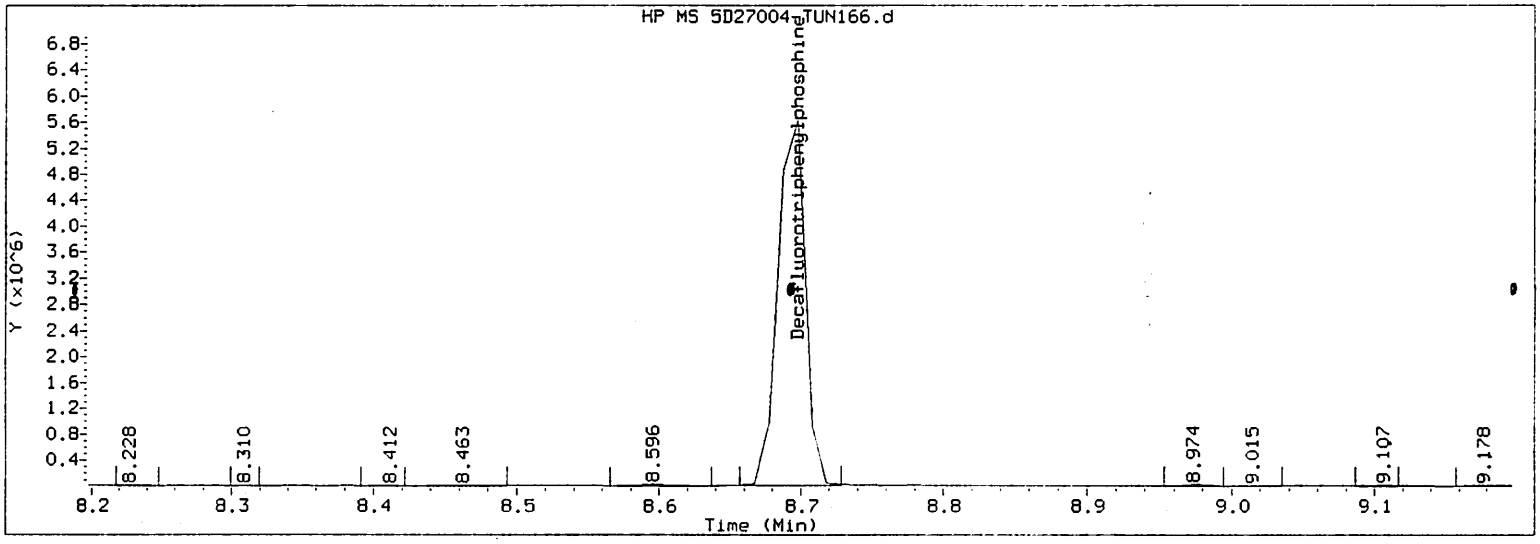
Report Date: 04/28/2015 09:50

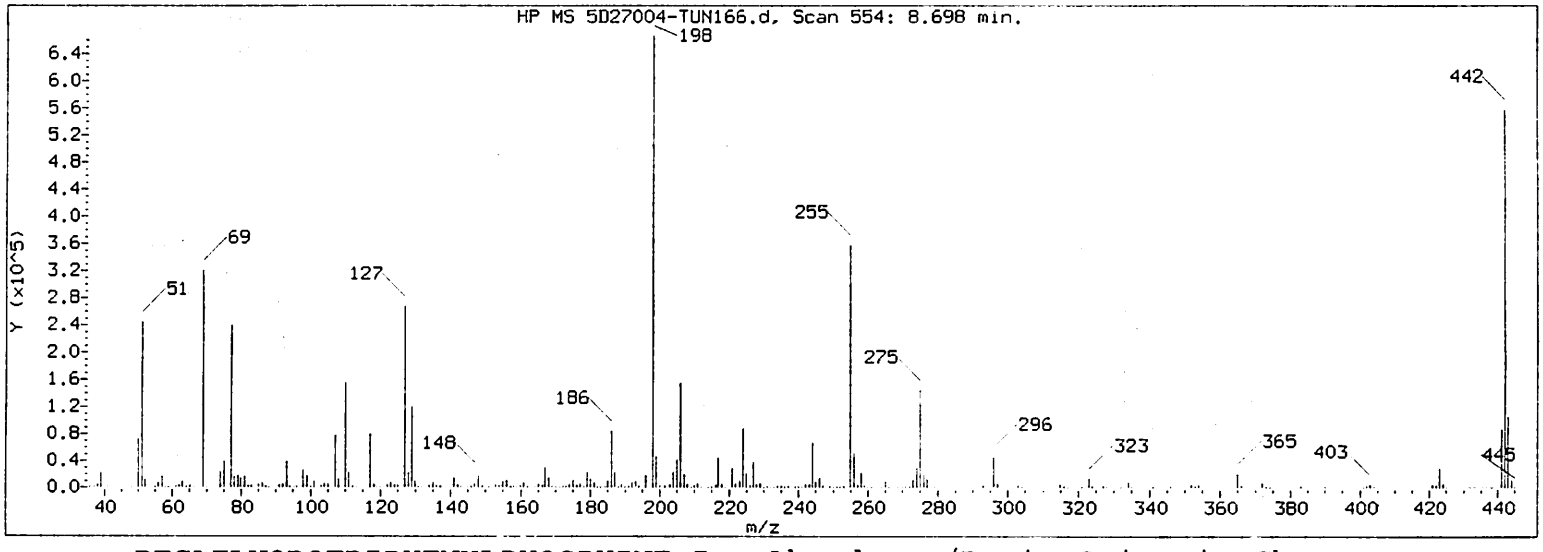
Datafile Analyzed: /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d/5D27004-TUN16
Method Used: /chem/5972hp66.i/D5D27004C66.b/dftpp8270D.m Inst: 5972hp66
Injection Date: 27-APR-2015 16:59 Operator: OWS
Sample Info: 5D27004-TUN1 5D27004-TUN1:OWS
Misc Info: DFTPPCY



Report Date: 04/28/2015 09:50

Datafile Analyzed: /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d/5D27004-TUN16
Method Used: /chem/5972hp66.i/D5D27004C66.b/dftpp8270D.m Inst: 5972hp66
Injection Date: 27-APR-2015 16:59 Operator: OWS
Sample Info: 5D27004-TUN1 5D27004-TUN1:OWS
Misc Info: DFTPPCY





DECAFLUOROTRIPHENYLPHOSPHINE Ion Abundance/Ratio Criteria Chart

Ion	Abundance Criteria	Base Peak	Other	Test
198	Base Peak, 100% relative abundance	100.00		PASS
51	10 - 80% of mass 198	46.58		PASS
68	Less than 2% of mass 69	0.00	(0.00)	PASS
69	Mass 69 relative abundance	58.82		PASS
70	Less than 2% of mass 69	0.11	(0.18)	PASS
127	10 - 80% of mass 198	44.42		PASS
197	Less than 2% of mass 198	0.00	(0.00)	PASS
199	5 - 9% of mass 198	6.91		PASS
275	10 - 60% of mass 198	20.45		PASS
365	Greater than 1% of mass 198	2.90		PASS
441	Present, but less than mass 443	11.76	(83.08)	PASS
442	50 - 100% of mass 198	75.28		PASS
443	15 - 24% of mass 442	14.16	(18.81)	PASS

Robin Hamm 4/28/2015

ANALYSIS DATA SHEET

SW8270D

SBLKVI

Client: DRAPER ADEN ASSOCIATES SDG: 1504088 Project: RAAP APPIX 2015 UNIT 5

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042401-BLK166.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042401-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 18:00

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
98-95-3	Nitrobenzene		1.3	10	U
88-74-4	2-Nitroaniline		1.5	10	U
606-20-2	2,6-Dinitrotoluene		0.75	10	U
121-14-2	2,4-Dinitrotoluene		0.84	10	U
84-66-2	Diethylphthalate		0.52	10	U
100-01-6	4-Nitroaniline		2.7	20	U
117-81-7	bis(2-ethylhexyl)Phthalate		1.5	6.0	U

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	69.11	69	33 - 110	
Phenol-d5	100.0	43.47	43	20 - 110	
Nitrobenzene-d5	50.00	45.65	91	45 - 110	
2-Fluorobiphenyl	50.00	41.29	83	46 - 110	
2,4,6-Tribromophenol	100.0	79.74	80	42 - 119	
Terphenyl-d14	50.00	46.11	92	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

B. Patterson
Assigned To
2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

H: 4/27
D: 5/13

5042401

SVOC 8270D

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-27-15 @ 1023

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH		QC	Surr (uL)	Comments
					A/N	BASE			
1504088-01	5W7B	Sample	1000	1000	1.6	13	QC	500	
1504088-02	5W5B	Sample	1000	1000	1.6	13	NR	500	
1504088-03	5WC21	Sample	1000	1000	1.6	13		500	
1504088-04	5WDUP	Sample	1000	1000	1.3	13		500	
1504088-05	5WC22	Sample	1000	1000	1.9	13		500	
1504088-06	5WC23	Sample	1000	1000	1.6	13		500	
1504091-01	16-2	Sample	1000	1000	1.6	13		500	
1504091-02	16-3	Sample	1000	1000	1.9	13		500	
1504091-03	16-5	Sample	1000	1000	1.9	13		500	
1504091-04	16WC2B	Sample	1000	1000	1.6	13		500	
1504091-05	16SPRING	Sample	1000	1000	1.6	13		500	
5042401-BLK1	SBLKV1	Blank	1000	1000	1.6	13		500	
5042401-BS1	SLCSV1	LCS	1000	1000	1.6	13		500	
5042401-BSD1	SLCSDV1	LCS Dup	1000	1000	1.9	13		500	
5042401-MS1	5W7BMS	Matrix Spike	1000	1000	1.9	13		500	
5042401-MSD1	5W7BMSD	Matrix Spike Dup	1000	1000	1.6	13	NR	500	

4-27-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		5D27002
SPIKE	8270 Full Short LCS/MS Spike 1	500	LCS/LCSD	5C30005
SPIKE	8270 Full Short LCS/MS Spike 1	500	MS/MSD	5C30005

Surrogate & Spike Added By: BFP 4-27-15
Initials / Date

Spiking Witnessed By: CH 4.27.15
Initials / Date

Final Vol Verified: B Patterson

Reviewed By: CH Oakley

Analysts Initials: Extracted: BFP, CH KD: CH, BFP N2: BFP Bottled up: BFP

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - 5D03003, CH_2Cl_2 - 5D20002, H_2SO_4 - 4F27003, 10N NaOH - 5C31014

CompuChem
A Division Of
Liberty Analytical Corp.

4/30/2015

Abridged data package.
Full deliverable
available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

WorkOrder: 1504090

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13 **Sdg:** 1504090

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504090-01	16WC1A	Water	04/22/2015 13:45	04/23/2015 14:10
1504090-02	16C1	Water	04/22/2015 15:10	04/23/2015 14:10
1504090-03	16MW8	Water	04/22/2015 10:15	04/23/2015 14:10
1504090-04	16MW9	Water	04/22/2015 11:30	04/23/2015 14:10
1504090-05	16WDUP	Water	04/22/2015 13:55	04/23/2015 14:10
1504090-06	16WC1B	Water	04/22/2015 12:40	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Laboratory: COMPUCHEM

SDG: 1504090

Client Sample Id:	Analysis:	Lab Sample Id:
16WC1A	EPA 7470A	1504090-01
16WC1A	EPA 9010C/9012B	1504090-01
16WC1A	EPA 6020A	1504090-01
16C1	EPA 6020A	1504090-02
16C1	EPA 7470A	1504090-02
16C1	EPA 9010C/9012B	1504090-02
16MW8	EPA 6020A	1504090-03
16MW8	EPA 7470A	1504090-03
16MW8	EPA 9010C/9012B	1504090-03
16MW9	EPA 7470A	1504090-04
16MW9	EPA 6020A	1504090-04
16MW9	EPA 9010C/9012B	1504090-04
16MW9	EPA 6020A	1504090-04RE1
16WDUP	EPA 6020A	1504090-05
16WDUP	EPA 7470A	1504090-05
16WDUP	EPA 9010C/9012B	1504090-05
16WC1B	EPA 9010C/9012B	1504090-06
16WC1B	EPA 6020A	1504090-06
16WC1B	EPA 7470A	1504090-06

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 04/30/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

The indicated Sample Delivery Group (SDG) consisting of six (6) water samples was received into the laboratory information management system (LIMS) on April 23, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The cooler temperature indicator bottle was found with the samples and the samples temperature was -0.4, -0.1, 0.1, 0.2, and 0.7 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A/7470A/9010C/9012B methodology for the requested metals, mercury, and cyanide.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Cobalt for sample 16WC1A

$$\frac{5.80326\ \mu g/L\ (C) \times 0.10\ L\ (F)}{0.10\ L\ (I)} = 5.803\ \mu g/L \text{ reported as } 5.80\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5042418-MS1 (16WC1AS) was found to be inside control limit except silver.

The mercury sample matrix spike, CCN = 5042403-MS1 (16WC1AS) was found to be inside control limits.

The cyanide sample matrix spike, CCN = 5042801-MS1 (16WC1AS) was found to be inside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5042418-MSD1 (16WC1ASD) was found to be inside control limits except beryllium and silver.

The mercury sample matrix duplicate spike, CCN = 5042403-MSD1 (16WC1ASD) was found to be inside control limits.

The cyanide sample matrix duplicate spike, CCN = 5042801-MSD1 (16WC1ASD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5042418-DUP1 (16WC1AD) was found to be inside control limits.

The mercury sample duplicate, CCN = 5042403-DUP1 (16WC1AD) was found to be inside control limits.

The cyanide sample duplicate, CCN = 5042801-DUP1 (16WC1AD) was found to be inside control limits.

A five-fold serial dilution of sample, CCN = SDI1504090-01 (16WC1AL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5042418-PS1 (16WC1AA) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
April 30, 2015

CHAIN OF CUSTODY RECORD

RESULTS 4/10/2015

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

Client: 0	**Consultant:**	Draper Aden Associates	**Sample Site:**	RFAAP, Radford, Virginia	**Project Specific (PS) or Batch (B) QC:**
Attn: 0	**Attn:**	Jenet C. Frazier			**Sample Collection for Project Complete?** YES
Address: 0	**Address:**	2206 South Main Street	**Location:**	HWMU16	
0		Blacksburg, Virginia 24060			**Carrier:** DASH COURIER
Phone: 0	**Phone:**	(540) 552-0444	**Event:**	2Q 2015 Annual Groundwater Monitoring Event	**Tracking Number:**
Fax: 0	**Fax:**	(540) 552-0291	**OAA JN:**	B03204-13	
Fax: 0			**Lab JN:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G		G	G				
Box 3 - Filtered/Unfiltered					U	U		U	U				
Required pH of Sample					<2	<2			>12				
Box 2 - Preservative					B	B		H	E				
Box 5 - Sample Container Type					1-500 ml P			2-1L AG	1-500-P				
Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	ICP/MS 6020A/3005A (Metals-Total)	7470A (Mercury-Total)		8270D/3510C (Semivolatiles)	9012B/9010C(Cyanide)	metals pH	cyanide pH		
16C1	4/22	1510	GW	4	X	X		X	X	<2	>12	1504090-02	
16MW8		1015	GW	4	X	X		X	X	<2	>12	-03	
16MW9		1130	GW	4	X	X		X	X	<2	>12	-04	
16WC1A		1345	GW	10 12	X	X		X	X	<2	>12	-01	(1) 500mL P container USE FOR QC for ms/msd/matrix spiked
16WDUP		1355	GW	4	X	X		X	X	<2	>12	-05	
16WC1B		1240	GW	4	X	X		X	X	<2	>12	-06	
16-2	4/21	1200	GW	3	X	X		X		<2		1504091-01	
16-3	4/21	1300	GW	3	X	X		X		<2		-02	
16-5	4/21	1410	GW	3	X	X		X		<2		-03	
16WC2B	4/22	0915	GW	3	X	X		X		<2		-04	
16SPRING	4/21	1430	GW	3	X	X		X		<2		-05	

GENERAL NOTES:
1. Report results to detection limit, with J flags, for italicized wells.
2. Report results at or greater than QL for non-italicized wells.
3. ERIS Deliverable required.
4. VELAP accreditation required.
5. Full deliverable.

Clients Special Instructions: Level 4 with edd. See attached target analyte list. 0.1°C, 0.7°C, -0.4°C, -0.1°C, 0.2°C, 0.1°C CN 16WC1B in (5) coolers @

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival ✓ Received on Ice ✓ Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/21/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): TAYLOR	Date: 4/23/15	Sample Storage Time Requested:	
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1035	Company Name: DASH COURIER	Time: 1410		
Sampler Name (Print): Tyler Emery	Date: 4/21/15	#1 Received by (Signature): TAYLOR	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG	
Sampler Signature:	Time: 0800	Company Name: DASH	Time: 10:35	Company Name: CompuChem	Time: 1410		

1/8 JVR 4/17/15

HOLDING TIME SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16WC1A	04/22/15	04/23/15	04/24/15	04/30/15	7.9	180	
16C1	04/22/15	04/23/15	04/24/15	04/30/15	7.9	180	
16MW8	04/22/15	04/23/15	04/24/15	04/30/15	8.1	180	
16MW9	04/22/15	04/23/15	04/24/15	04/30/15	8.0	180	
16MW9	04/22/15	04/23/15	04/24/15	04/30/15	8.1	180	
16WDUP	04/22/15	04/23/15	04/24/15	04/30/15	7.9	180	
16WC1B	04/22/15	04/23/15	04/24/15	04/30/15	8.0	180	

HOLDING TIME SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16WC1A	04/22/15	04/23/15	04/24/15	04/27/15	4.9	28	
16C1	04/22/15	04/23/15	04/24/15	04/27/15	4.8	28	
16MW8	04/22/15	04/23/15	04/24/15	04/27/15	5.0	28	
16MW9	04/22/15	04/23/15	04/24/15	04/27/15	5.0	28	
16WDUP	04/22/15	04/23/15	04/24/15	04/27/15	4.9	28	
16WC1B	04/22/15	04/23/15	04/24/15	04/27/15	5.0	28	

HOLDING TIME SUMMARY

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16WC1A	04/22/15	04/23/15	04/28/15	04/28/15	6.0	14	
16C1	04/22/15	04/23/15	04/28/15	04/28/15	5.9	14	
16MW8	04/22/15	04/23/15	04/28/15	04/28/15	6.1	14	
16MW9	04/22/15	04/23/15	04/28/15	04/28/15	6.1	14	
16WDUP	04/22/15	04/23/15	04/28/15	04/28/15	6.0	14	
16WC1B	04/22/15	04/23/15	04/28/15	04/28/15	6.0	14	

METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504090

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: WATER **Instrument:** C2

Analyte	MDL	RL	Units	Method
Cyanide	4	20.0	ug/L	EPA 9010C/9012B

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METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504090

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Antimony	0.4	2.00	ug/L	EPA 6020A
Arsenic	2	10.0	ug/L	EPA 6020A
Barium	1	10.0	ug/L	EPA 6020A
Beryllium	0.2	1.00	ug/L	EPA 6020A
Cadmium	0.2	1.00	ug/L	EPA 6020A
Chromium	1	5.00	ug/L	EPA 6020A
Cobalt	1	5.00	ug/L	EPA 6020A
Copper	1	5.00	ug/L	EPA 6020A
Lead	0.2	1.00	ug/L	EPA 6020A
Nickel	2	10.0	ug/L	EPA 6020A
Selenium	3	5.00	ug/L	EPA 6020A
Silver	0.2	1.00	ug/L	EPA 6020A
Thallium	0.2	1.00	ug/L	EPA 6020A
Vanadium	1	10.0	ug/L	EPA 6020A
Zinc	3	10.0	ug/L	EPA 6020A

METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1504090

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water **Instrument:** V4

Analyte	MDL	RL	Units	Method
Mercury	0.2	2.00	ug/L	EPA 7470A

LCS / LCS DUPLICATE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-BS1 Matrix: Water Client ID: MLCSWM Batch: 5042403

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Mercury	4.000	3.77	94		80 - 120

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LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042418-BS1 Matrix: Water Client ID: MLCSWR Batch: 5042418

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Antimony	220.0	200	90.7		80 - 120
Arsenic	220.0	202	91.9		80 - 120
Barium	110.0	105	95.6		80 - 120
Beryllium	110.0	114	103		80 - 120
Cadmium	110.0	99.6	90.6		80 - 120
Chromium	110.0	108	98.5		80 - 120
Cobalt	110.0	107	97.2		80 - 120
Copper	110.0	109	98.7		80 - 120
Lead	220.0	211	95.8		80 - 120
Nickel	110.0	111	101		80 - 120
Selenium	220.0	197	89.5		80 - 120
Silver	110.0	98.3	89.4		80 - 120
Thallium	220.0	209	95.1		80 - 120
Vanadium	110.0	110	99.7		80 - 120
Zinc	220.0	208	94.7		80 - 120

LCS / LCS DUPLICATE SUMMARY

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042801-BS1 Matrix: Water Client ID: MLCSWT Batch: 5042801

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Cyanide	250.0	268	107		72 - 128

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-MS2 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Mercury	1.000	2.00 U	0.998	100		75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-MSD2 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Mercury	1.000	0.949	95	5		20	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042418-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Antimony	220.0	2.00 U	223	101		75 - 125
Arsenic	220.0	10.0 U	232	105		75 - 125
Barium	110.0	257	366	98.4		75 - 125
Beryllium	110.0	1.00 U	132	120		75 - 125
Cadmium	110.0	1.00 U	119	109		75 - 125
Chromium	110.0	5.00 U	129	117		75 - 125
Cobalt	110.0	5.80	127	110		75 - 125
Copper	110.0	5.00 U	116	105		75 - 125
Lead	220.0	1.00 U	255	116		75 - 125
Nickel	110.0	8.44 J	129	110		75 - 125
Selenium	220.0	5.00 U	223	101		75 - 125
Silver	110.0	1.00 U	75.6	68.8	*	75 - 125
Thallium	220.0	1.00 U	264	120		75 - 125
Vanadium	110.0	10.0 U	129	117		75 - 125
Zinc	220.0	5.31 J	228	101		75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042418-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Antimony	220.0	229	104	2.97		20	75 - 125
Arsenic	220.0	237	108	2.25		20	75 - 125
Barium	110.0	375	107	8.01		20	75 - 125
Beryllium	110.0	140	127	5.39	*	20	75 - 125
Cadmium	110.0	122	111	1.91		20	75 - 125
Chromium	110.0	123	111	4.85		20	75 - 125
Cobalt	110.0	127	110	0.405		20	75 - 125
Copper	110.0	116	105	0.143		20	75 - 125
Lead	220.0	259	118	1.86		20	75 - 125
Nickel	110.0	129	109	0.754		20	75 - 125
Selenium	220.0	235	107	5.23		20	75 - 125
Silver	110.0	78.0	70.9	3.07	*	20	75 - 125
Thallium	220.0	260	118	1.28		20	75 - 125
Vanadium	110.0	127	115	1.80		20	75 - 125
Zinc	220.0	232	103	1.90		20	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 9010C/9012B

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042801-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Cyanide	100.0	20.0 U	120	120		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 9010C/9012B

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042801-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Cyanide	100.0	113	113	6.23		20	75 - 125

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SERIAL DILUTION

EPA 6020A

16WC1AL

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5D30007-SRD3 Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

Sequence: 5D30007 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Antimony	2.00 U	10.00 U	2.00			EPA 6020A	10
Arsenic	10.00 U	50.00 U	10.0			EPA 6020A	10
Barium	257.46	240.13	10.0	6.73		EPA 6020A	10
Beryllium	1.00 U	5.00 U	1.00			EPA 6020A	10
Cadmium	1.00 U	5.00 U	1.00			EPA 6020A	10
Chromium	5.00 U	25.00 U	5.00			EPA 6020A	10
Cobalt	5.80	5.91 J	5.00	1.80		EPA 6020A	10
Copper	5.00 U	25.00 U	5.00			EPA 6020A	10
Lead	1.00 U	5.00 U	1.00			EPA 6020A	10
Nickel	8.44 J	50.00 U	10.0			EPA 6020A	10
Selenium	5.00 U	25.00 U	5.00			EPA 6020A	10
Silver	1.00 U	5.00 U	1.00			EPA 6020A	10
Thallium	1.00 U	5.00 U	1.00			EPA 6020A	10
Vanadium	10.00 U	50.00 U	10.0			EPA 6020A	10
Zinc	5.31 J	50.00 U	10.0			EPA 6020A	10

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020A

16WC1AA

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Matrix: Water
Laboratory ID: 5042418-PS1
Lab Source ID: 1504090-01

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Antimony	20.5	U	20.00	102	75 - 125
Arsenic	11.1	U	10.00	103	75 - 125
Barium	370	257	100.0	113	75 - 125
Beryllium	10.7	U	10.00	107	75 - 125
Cadmium	9.95	U	10.00	99.3	75 - 125
Chromium	20.8	U	20.00	104	75 - 125
Cobalt	16.5	5.80	10.00	107	75 - 125
Copper	20.4	U	20.00	100	75 - 125
Lead	11.5	U	10.00	114	75 - 125
Nickel	19.6	8.44 J	10.00	112	75 - 125
Selenium	49.4	U	50.00	98.3	75 - 125
Silver	9.59	U	10.00	95.4	75 - 125
Thallium	11.7	U	10.00	116	75 - 125
Vanadium	53.3	U	50.00	107	75 - 125
Zinc	24.7	5.31 J	20.00	97.1	75 - 125

DUPLICATES

EPA 7470A

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-DUP2 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Mercury	20	*2.00 U*	2.00 U			EPA 7470A

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DUPLICATES

EPA 6020A

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042418-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Antimony	20	*2.00 U*	2.00 U			EPA 6020A
Arsenic	20	*10.0 U*	10.0 U			EPA 6020A
Barium	20	*257*	256	0.633		EPA 6020A
Beryllium	20	*1.00 U*	1.00 U			EPA 6020A
Cadmium	20	*1.00 U*	1.00 U			EPA 6020A
Chromium	20	*5.00 U*	5.00 U			EPA 6020A
Cobalt	20	*5.80*	5.97	2.81		EPA 6020A
Copper	20	*5.00 U*	5.00 U			EPA 6020A
Lead	20	*1.00 U*	1.00 U			EPA 6020A
Nickel	20	*8.44 J*	8.73 J	3.34		EPA 6020A
Selenium	20	*5.00 U*	5.00 U			EPA 6020A
Silver	20	*1.00 U*	1.00 U			EPA 6020A
Thallium	20	*1.00 U*	1.00 U			EPA 6020A
Vanadium	20	*10.0 U*	10.0 U			EPA 6020A
Zinc	20	*5.31 J*	6.07 J	13.2		EPA 6020A

DUPLICATES

EPA 9010C/9012B

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042801-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Cyanide	20	*20.0 U*	20.0 U			EPA 9010C/9012B

PREPARATION BATCH SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042403 Matrix: Water Preparation: EPA 7470A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1504090-01	04/24/15 10:30	100	100
16C1	1504090-02	04/24/15 10:30	100	100
16MW8	1504090-03	04/24/15 10:30	100	100
16MW9	1504090-04	04/24/15 10:30	100	100
16WDUP	1504090-05	04/24/15 10:30	100	100
16WC1B	1504090-06	04/24/15 10:30	100	100
PBWWM	5042403-BLK1	04/24/15 10:30	100	100
MLCSWM	5042403-BS1	04/24/15 10:30	100	100
16WC1AD	5042403-DUP2	04/24/15 10:30	100	100
16WC1AS	5042403-MS2	04/24/15 10:30	100	100
16WC1ASD	5042403-MSD2	04/24/15 10:30	100	100

PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042418 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1504090-01	04/24/15 15:00	100	100
16C1	1504090-02	04/24/15 15:00	100	100
16MW8	1504090-03	04/24/15 15:00	100	100
16MW9	1504090-04	04/24/15 15:00	100	100
16MW9	1504090-04RE1	04/24/15 15:00	100	100
16WDUP	1504090-05	04/24/15 15:00	100	100
16WC1B	1504090-06	04/24/15 15:00	100	100
PBWWR	5042418-BLK1	04/24/15 15:00	100	100
MLCSWR	5042418-BS1	04/24/15 15:00	100	100
16WC1AD	5042418-DUP1	04/24/15 15:00	100	100
16WC1AS	5042418-MS1	04/24/15 15:00	100	100
16WC1ASD	5042418-MSD1	04/24/15 15:00	100	100
16WC1AA	5042418-PS1	04/24/15 15:00	100	100

PREPARATION BATCH SUMMARY

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042801 Matrix: Water Preparation: EPA 9010C

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1504090-01	04/28/15 09:10	50.0	50.0
16C1	1504090-02	04/28/15 09:10	50.0	50.0
16MW8	1504090-03	04/28/15 09:10	50.0	50.0
16MW9	1504090-04	04/28/15 09:10	50.0	50.0
16WDUP	1504090-05	04/28/15 09:10	50.0	50.0
16WC1B	1504090-06	04/28/15 09:10	50.0	50.0
PBWWT	5042801-BLK1	04/28/15 09:10	50.0	50.0
MLCSWT	5042801-BS1	04/28/15 09:10	50.0	50.0
16WC1AD	5042801-DUP1	04/28/15 09:10	50.0	50.0
16WC1AS	5042801-MS1	04/28/15 09:10	50.0	50.0
16WC1ASD	5042801-MSD1	04/28/15 09:10	50.0	50.0

ANALYSIS SEQUENCE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Calibration: 5042801 Instrument: V4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
S0	5D27008-CAL1	5D27008_P-001	04/27/15 09:54:13
0.2	5D27008-CAL2	5D27008_P-002	04/27/15 09:57:16
S0.5	5D27008-CAL3	5D27008_P-003	04/27/15 10:00:17
S1.0	5D27008-CAL4	5D27008_P-004	04/27/15 10:02:56
S5.0	5D27008-CAL5	5D27008_P-005	04/27/15 10:05:25
S10.0	5D27008-CAL6	5D27008_P-006	04/27/15 10:08:07
ICV	5D27008-ICV1	5D27008_P-007	04/27/15 10:10:38
ICB	5D27008-ICB1	5D27008_P-008	04/27/15 10:14:50
CCV	5D27008-CCV1	5D27008_P-010	04/27/15 10:21:24
CCB	5D27008-CCB1	5D27008_P-011	04/27/15 10:24:32
PBWWM	5042403-BLK1	5D27008_P-012	04/27/15 10:27:20
MLCSWM	5042403-BS1	5D27008_P-013	04/27/15 10:30:19
CCV	5D27008-CCV2	5D27008_P-022	04/27/15 10:54:17
CCB	5D27008-CCB2	5D27008_P-023	04/27/15 10:56:56
16WC1A	1504090-01	5D27008_P-026	04/27/15 11:05:20
16WC1AD	5042403-DUP2	5D27008_P-027	04/27/15 11:07:50
16WC1AS	5042403-MS2	5D27008_P-028	04/27/15 11:10:32
16WC1ASD	5042403-MSD2	5D27008_P-029	04/27/15 11:13:31
16C1	1504090-02	5D27008_P-030	04/27/15 11:16:15
16MW8	1504090-03	5D27008_P-031	04/27/15 11:18:54
16MW9	1504090-04	5D27008_P-032	04/27/15 11:21:53
16WDUP	1504090-05	5D27008_P-033	04/27/15 11:24:23
CCV	5D27008-CCV3	5D27008_P-034	04/27/15 11:26:52
CCB	5D27008-CCB3	5D27008_P-035	04/27/15 11:29:22
16WC1B	1504090-06	5D27008_P-036	04/27/15 11:32:14
CCV	5D27008-CCV4	5D27008_P-046	04/27/15 12:00:12
CCB	5D27008-CCB4	5D27008_P-047	04/27/15 12:02:43

ANALYSIS SEQUENCE SUMMARY

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28008 Calibration: 5042805 Instrument: C2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
S400	5D28008-CAL8	5D28008_P-001	04/28/15 12:34:50
S300	5D28008-CAL7	5D28008_P-002	04/28/15 12:35:55
S200	5D28008-CAL6	5D28008_P-003	04/28/15 12:37:00
S100	5D28008-CAL5	5D28008_P-004	04/28/15 12:38:05
S50	5D28008-CAL4	5D28008_P-005	04/28/15 12:39:11
S20	5D28008-CAL3	5D28008_P-006	04/28/15 12:40:18
S10	5D28008-CAL2	5D28008_P-007	04/28/15 12:41:25
S0	5D28008-CAL1	5D28008_P-008	04/28/15 12:42:32
ICV	5D28008-ICV1	5D28008_P-009	04/28/15 12:43:38
ICB	5D28008-ICB1	5D28008_P-010	04/28/15 12:44:45
CCV	5D28008-CCV1	5D28008_P-011	04/28/15 12:45:50
CCB	5D28008-CCB1	5D28008_P-012	04/28/15 12:46:57
LRS	5D28008-LCV1	5D28008_P-013	04/28/15 12:48:02
HRS	5D28008-HCV1	5D28008_P-014	04/28/15 12:49:08
PBWWT	5042801-BLK1	5D28008_P-015	04/28/15 12:50:14
MLCSWT	5042801-BS1	5D28008_P-016	04/28/15 12:51:21
16WC1A	1504090-01	5D28008_P-017	04/28/15 12:52:28
16WC1AD	5042801-DUP1	5D28008_P-018	04/28/15 12:53:34
16WC1AS	5042801-MS1	5D28008_P-019	04/28/15 12:54:41
16WC1ASD	5042801-MSD1	5D28008_P-020	04/28/15 12:55:47
16C1	1504090-02	5D28008_P-021	04/28/15 12:56:53
16MW8	1504090-03	5D28008_P-022	04/28/15 12:57:59
CCV	5D28008-CCV2	5D28008_P-023	04/28/15 12:59:04
CCB	5D28008-CCB2	5D28008_P-024	04/28/15 13:00:12
16MW9	1504090-04	5D28008_P-025	04/28/15 13:01:17
16WDUP	1504090-05	5D28008_P-026	04/28/15 13:02:27
16WC1B	1504090-06	5D28008_P-027	04/28/15 13:03:33
CCV	5D28008-CCV3	5D28008_P-030	04/28/15 13:09:21
CCB	5D28008-CCB3	5D28008_P-031	04/28/15 13:10:28

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
TUN1	5D30007-TUN1	5D30007_P-001	04/30/15 08:33:23
S0	5D30007-CAL1	5D30007_P-002	04/30/15 09:49:11
S 6020-MS1	5D30007-CAL2	5D30007_P-003	04/30/15 09:50:59
S 6020-MS2	5D30007-CAL3	5D30007_P-004	04/30/15 09:52:45
S 6020-MS3	5D30007-CAL4	5D30007_P-005	04/30/15 09:54:32
S 6020-MS4	5D30007-CAL5	5D30007_P-006	04/30/15 09:56:19
S 6020-MS5	5D30007-CAL6	5D30007_P-007	04/30/15 09:58:06
LLICV	5D30007-CRL1	5D30007_P-008	04/30/15 10:01:34
ICV	5D30007-ICV1	5D30007_P-009	04/30/15 10:03:22
ICB	5D30007-ICB1	5D30007_P-010	04/30/15 10:05:10
ICSA	5D30007-IFA1	5D30007_P-011	04/30/15 10:06:57
ICSAB	5D30007-IFB1	5D30007_P-012	04/30/15 10:08:44
LLCCV	5D30007-CRL2	5D30007_P-013	04/30/15 10:10:32
CCV	5D30007-CCV1	5D30007_P-014	04/30/15 10:12:20
CCB	5D30007-CCB1	5D30007_P-015	04/30/15 10:14:07
LLCCV	5D30007-CRL3	5D30007_P-025	04/30/15 10:33:58
CCV	5D30007-CCV2	5D30007_P-026	04/30/15 10:35:46
CCB	5D30007-CCB2	5D30007_P-027	04/30/15 10:37:33
CCV	5D30007-CCV3	5D30007_P-038	04/30/15 11:08:11
CCB	5D30007-CCB3	5D30007_P-039	04/30/15 11:09:58
PBWWR	5042418-BLK1	5D30007_P-042	04/30/15 11:15:20
MLCSWR	5042418-BS1	5D30007_P-043	04/30/15 11:17:07
16WC1A	1504090-01	5D30007_P-044	04/30/15 11:18:54
16WC1AD	5042418-DUP1	5D30007_P-045	04/30/15 11:20:40
16WC1AS	5042418-MS1	5D30007_P-046	04/30/15 11:22:27
16WC1ASD	5042418-MSD1	5D30007_P-047	04/30/15 11:24:14
16WC1AL	5D30007-SRD3	5D30007_P-048	04/30/15 11:26:01
LLCCV	5D30007-CRL4	5D30007_P-049	04/30/15 11:27:49
CCV	5D30007-CCV4	5D30007_P-050	04/30/15 11:29:37

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
CCB	5D30007-CCB4	5D30007_P-051	04/30/15 11:31:24
16WC1AA	5042418-PS1	5D30007_P-052	04/30/15 11:56:27
16C1	1504090-02	5D30007_P-053	04/30/15 11:58:14
16MW8	1504090-03	5D30007_P-054	04/30/15 12:00:00
16MW9	1504090-04	5D30007_P-055	04/30/15 12:01:47
16WDUP	1504090-05	5D30007_P-056	04/30/15 12:03:34
16WC1B	1504090-06	5D30007_P-057	04/30/15 12:05:21
CCV	5D30007-CCV5	5D30007_P-062	04/30/15 12:14:17
CCB	5D30007-CCB5	5D30007_P-063	04/30/15 12:16:04
LLCCV	5D30007-CRL5	5D30007_P-072	04/30/15 12:32:08
CCV	5D30007-CCV6	5D30007_P-073	04/30/15 12:33:56
CCB	5D30007-CCB6	5D30007_P-074	04/30/15 12:35:43
CCV	5D30007-CCV7	5D30007_P-085	04/30/15 13:16:18
CCB	5D30007-CCB7	5D30007_P-086	04/30/15 13:18:05
16MW9	1504090-04RE1	5D30007_P-089	04/30/15 13:26:49
LLCCV	5D30007-CRL6	5D30007_P-096	04/30/15 13:40:10
CCV	5D30007-CCV8	5D30007_P-097	04/30/15 13:41:59
CCB	5D30007-CCB8	5D30007_P-098	04/30/15 13:43:45

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L. Target Element Results

(ANALYSIS DATA SHEETS)

ANALYSIS DATA SHEET

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-01 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-39-3	Barium	257	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 11:18
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-48-4	Cobalt	5.80	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 11:18
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 12:52
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:05
7440-02-0	Nickel	8.44	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 11:18
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 11:18
7440-66-6	Zinc	5.31	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 11:18

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ANALYSIS DATA SHEET

16C1

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-02 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-39-3	Barium	167	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 11:58
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 12:56
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:16
7440-02-0	Nickel	4.99	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 11:58
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 11:58
7440-66-6	Zinc	3.13	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 11:58

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ANALYSIS DATA SHEET

16MW8

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-03 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-39-3	Barium	139	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 12:00
7440-41-7	Beryllium	0.341	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 12:00
7440-43-9	Cadmium	0.235	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 12:00
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-48-4	Cobalt	1.25	1.00	5.00	1	J	EPA 6020A	5D30007	4/30/15 12:00
7440-50-8	Copper	16.9	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 12:00
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 12:57
7439-92-1	Lead	0.769	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 12:00
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:18
7440-02-0	Nickel	4.21	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 12:00
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:00
7440-66-6	Zinc	54.9	3.00	10.0	1		EPA 6020A	5D30007	4/30/15 12:00

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ANALYSIS DATA SHEET

16MW9

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-04 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-39-3	Barium	551	2.00	20.0	2	D	EPA 6020A	5D30007	4/30/15 13:26
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-48-4	Cobalt	5.30	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 12:01
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 13:01
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:21
7440-02-0	Nickel	18.7	2.00	10.0	1		EPA 6020A	5D30007	4/30/15 12:01
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:01
7440-66-6	Zinc		3.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:01

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ANALYSIS DATA SHEET

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-05 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-39-3	Barium	253	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 12:03
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-43-9	Cadmium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-48-4	Cobalt	5.96	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 12:03
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 13:02
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:24
7440-02-0	Nickel	8.61	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 12:03
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:03
7440-66-6	Zinc	4.43	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 12:03

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ANALYSIS DATA SHEET

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504090-06 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-36-0	Antimony		0.400	2.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-38-2	Arsenic		2.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-39-3	Barium	130	1.00	10.0	1		EPA 6020A	5D30007	4/30/15 12:05
7440-41-7	Beryllium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-43-9	Cadmium	0.251	0.200	1.00	1	J	EPA 6020A	5D30007	4/30/15 12:05
7440-47-3	Chromium		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-48-4	Cobalt	22.3	1.00	5.00	1		EPA 6020A	5D30007	4/30/15 12:05
7440-50-8	Copper		1.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
57-12-5	Cyanide		4.00	20.0	1	U	EPA 9010C/9012B	5D28008	4/28/15 13:03
7439-92-1	Lead		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5D27008	4/27/15 11:32
7440-02-0	Nickel	7.00	2.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 12:05
7782-49-2	Selenium		3.00	5.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-22-4	Silver		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-28-0	Thallium		0.200	1.00	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-62-2	Vanadium		1.00	10.0	1	U	EPA 6020A	5D30007	4/30/15 12:05
7440-66-6	Zinc	8.29	3.00	10.0	1	J	EPA 6020A	5D30007	4/30/15 12:05

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LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLICV	5D30007-CRL1	Antimony	2.000	1.99	100	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Arsenic	1.000	1.17	117	ug/L	U	70 - 130
LLICV	5D30007-CRL1	Barium	10.00	9.42	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Beryllium	1.000	0.984	98	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cadmium	1.000	0.936	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Chromium	2.000	1.99	100	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cobalt	1.000	1.06	106	ug/L		70 - 130
LLICV	5D30007-CRL1	Copper	2.000	2.03	102	ug/L		70 - 130
LLICV	5D30007-CRL1	Lead	1.000	1.09	109	ug/L		70 - 130
LLICV	5D30007-CRL1	Nickel	1.000	1.10	110	ug/L	U	70 - 130
LLICV	5D30007-CRL1	Selenium	5.000	4.67	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Silver	1.000	1.16	116	ug/L		70 - 130
LLICV	5D30007-CRL1	Thallium	1.000	1.13	113	ug/L		70 - 130
LLICV	5D30007-CRL1	Vanadium	5.000	4.75	95	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Zinc	2.000	1.70	85	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Antimony	2.000	1.76	88	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Arsenic	1.000	0.875	88	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Barium	10.00	9.41	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Beryllium	1.000	0.930	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cadmium	1.000	0.927	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Chromium	2.000	1.85	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cobalt	1.000	0.901	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Copper	2.000	1.89	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Lead	1.000	0.955	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Nickel	1.000	0.942	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL2	Selenium	5.000	3.94	79	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Silver	1.000	0.885	89	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Thallium	1.000	0.942	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Vanadium	5.000	4.74	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Zinc	2.000	1.72	86	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Antimony	2.000	1.70	85	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Arsenic	1.000	0.748	75	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Barium	10.00	9.11	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Beryllium	1.000	0.917	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Chromium	2.000	1.72	86	ug/L	J	70 - 130

LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLCCV	5D30007-CRL3	Cobalt	1.000	0.902	90	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Copper	2.000	1.84	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Lead	1.000	0.941	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Nickel	1.000	0.935	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL3	Selenium	5.000	3.63	73	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Silver	1.000	0.872	87	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Thallium	1.000	0.982	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Vanadium	5.000	4.56	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Zinc	2.000	1.73	87	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Antimony	2.000	1.63	82	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Arsenic	1.000	1.05	105	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Barium	10.00	9.34	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Beryllium	1.000	0.950	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Chromium	2.000	1.90	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Cobalt	1.000	0.968	97	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Copper	2.000	1.95	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Lead	1.000	0.960	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Nickel	1.000	0.981	98	ug/L	U	70 - 130
LLCCV	5D30007-CRL4	Selenium	5.000	4.46	89	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Silver	1.000	0.840	84	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Thallium	1.000	0.960	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Vanadium	5.000	5.01	100	ug/L		70 - 130
LLCCV	5D30007-CRL4	Zinc	2.000	1.82	91	ug/L	U	70 - 130
LLCCV	5D30007-CRL5	Antimony	2.000	1.69	84	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Arsenic	1.000	0.850	85	ug/L	U	70 - 130
LLCCV	5D30007-CRL5	Barium	10.00	9.39	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Beryllium	1.000	0.969	97	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Cadmium	1.000	0.899	90	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Chromium	2.000	2.02	101	ug/L		70 - 130
LLCCV	5D30007-CRL5	Cobalt	1.000	1.01	101	ug/L		70 - 130
LLCCV	5D30007-CRL5	Copper	2.000	2.11	106	ug/L		70 - 130
LLCCV	5D30007-CRL5	Lead	1.000	0.959	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Nickel	1.000	1.10	110	ug/L	U	70 - 130
LLCCV	5D30007-CRL5	Selenium	5.000	4.15	83	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Silver	1.000	0.862	86	ug/L	J	70 - 130

LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLCCV	5D30007-CRL5	Thallium	1.000	0.935	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Vanadium	5.000	4.98	100	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Zinc	2.000	2.11	106	ug/L	U	70 - 130
LLCCV	5D30007-CRL6	Antimony	2.000	1.95	97	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Arsenic	1.000	0.909	91	ug/L	U	70 - 130
LLCCV	5D30007-CRL6	Barium	10.00	9.58	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Beryllium	1.000	1.07	107	ug/L		70 - 130
LLCCV	5D30007-CRL6	Cadmium	1.000	0.931	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Chromium	2.000	1.75	87	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Cobalt	1.000	0.942	94	ug/L	U	70 - 130
LLCCV	5D30007-CRL6	Copper	2.000	1.91	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Lead	1.000	0.995	100	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Nickel	1.000	0.983	98	ug/L	U	70 - 130
LLCCV	5D30007-CRL6	Selenium	5.000	4.01	80	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Silver	1.000	0.944	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Thallium	1.000	0.994	99	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Vanadium	5.000	4.68	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Zinc	2.000	1.89	95	ug/L	U	70 - 130

INITIAL CALIBRATION DATA

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Mercury	CAL1	S0	-42	0
Mercury	CAL2	0.2	1014	0.2
Mercury	CAL3	S0.5	2514	0.5
Mercury	CAL4	S1.0	4831	1
Mercury	CAL5	S5.0	25642	5
Mercury	CAL6	S10.0	51082	10

INITIAL CALIBRATION DATA (Continued)

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Mercury	0.0001953	0.01519	0.9999	0.995	

INITIAL CALIBRATION DATA

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042805 Instrument: C2

Calibration Date: 4/28/2015 12:34:10

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Cyanide	CAL1	S0	0.0097	0
Cyanide	CAL2	S10	0.4696	10
Cyanide	CAL3	S20	0.9364	20
Cyanide	CAL4	S50	2.2594	50
Cyanide	CAL5	S100	4.4405	100
Cyanide	CAL6	S200	8.7748	200
Cyanide	CAL7	S300	13.0927	300
Cyanide	CAL8	S400	16.9958	400

INITIAL CALIBRATION DATA (Continued)

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042805 Instrument: C2

Calibration Date: 4/28/2015 12:34:10

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Cyanide	23.38	-2.335	0.9998	0.995	

INITIAL CALIBRATION DATA

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Antimony	CAL1	S0	1957.147	0
Antimony	CAL2	S 6020-MS1	20983.11	2
Antimony	CAL3	S 6020-MS2	38450.21	4
Antimony	CAL4	S 6020-MS3	1328313	125
Antimony	CAL5	S 6020-MS4	2528040	250
Antimony	CAL6	S 6020-MS5	4756906	500
Arsenic	CAL1	S0	446.204	0
Arsenic	CAL2	S 6020-MS1	3062.335	1
Arsenic	CAL3	S 6020-MS2	5800.116	2
Arsenic	CAL4	S 6020-MS3	369236	125
Arsenic	CAL5	S 6020-MS4	752052.5	250
Arsenic	CAL6	S 6020-MS5	1466888	500
Barium	CAL1	S0	48.889	0
Barium	CAL2	S 6020-MS1	44368.78	10
Barium	CAL3	S 6020-MS2	84332.13	20
Barium	CAL4	S 6020-MS3	613986.2	125
Barium	CAL5	S 6020-MS4	1133056	250
Barium	CAL6	S 6020-MS5	2049108	500
Beryllium	CAL1	S0	3.333	0
Beryllium	CAL2	S 6020-MS1	330.561	1
Beryllium	CAL3	S 6020-MS2	692.246	2
Beryllium	CAL4	S 6020-MS3	46701.1	125
Beryllium	CAL5	S 6020-MS4	90208.43	250
Beryllium	CAL6	S 6020-MS5	182495.9	500
Cadmium	CAL1	S0	13.03	0
Cadmium	CAL2	S 6020-MS1	2876.564	1
Cadmium	CAL3	S 6020-MS2	5635.464	2

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Cadmium	CAL4	S 6020-MS3	387923	125
Cadmium	CAL5	S 6020-MS4	750563.9	250
Cadmium	CAL6	S 6020-MS5	1375188	500
Chromium	CAL1	S0	13376.17	0
Chromium	CAL2	S 6020-MS1	47435.57	2
Chromium	CAL3	S 6020-MS2	78210.35	4
Chromium	CAL4	S 6020-MS3	2366082	125
Chromium	CAL5	S 6020-MS4	4147018	250
Chromium	CAL6	S 6020-MS5	8398229	500
Cobalt	CAL1	S0	107.778	0
Cobalt	CAL2	S 6020-MS1	20452.02	1
Cobalt	CAL3	S 6020-MS2	39849.8	2
Cobalt	CAL4	S 6020-MS3	2821096	125
Cobalt	CAL5	S 6020-MS4	5047868	250
Cobalt	CAL6	S 6020-MS5	1.012255E+07	500
Copper	CAL1	S0	340.747	0
Copper	CAL2	S 6020-MS1	19867.88	2
Copper	CAL3	S 6020-MS2	38239.66	4
Copper	CAL4	S 6020-MS3	1308376	125
Copper	CAL5	S 6020-MS4	2470642	250
Copper	CAL6	S 6020-MS5	4683799	500
Lead	CAL1	S0	447.229	0
Lead	CAL2	S 6020-MS1	23097.85	1
Lead	CAL3	S 6020-MS2	43958.66	2
Lead	CAL4	S 6020-MS3	3081202	125
Lead	CAL5	S 6020-MS4	5582773	250
Lead	CAL6	S 6020-MS5	1.0705E+07	500
Nickel	CAL1	S0	44.445	0
Nickel	CAL2	S 6020-MS1	4362.064	1
Nickel	CAL3	S 6020-MS2	8650.036	2
Nickel	CAL4	S 6020-MS3	614451.9	125
Nickel	CAL5	S 6020-MS4	1080344	250
Nickel	CAL6	S 6020-MS5	2091607	500
Selenium	CAL1	S0	393.897	0
Selenium	CAL2	S 6020-MS1	1544.935	5

Selenium	CAL3	S 6020-MS2	2688.324	10
Selenium	CAL4	S 6020-MS3	31638.17	125
Selenium	CAL5	S 6020-MS4	68584.54	250
Selenium	CAL6	S 6020-MS5	131304.3	500
Silver	CAL1	S0	879.671	0
Silver	CAL2	S 6020-MS1	14141.48	1
Silver	CAL3	S 6020-MS2	26287.32	2
Silver	CAL4	S 6020-MS3	1838433	125
Silver	CAL5	S 6020-MS4	3581159	250
Silver	CAL6	S 6020-MS5	6539745	500
Thallium	CAL1	S0	208.336	0
Thallium	CAL2	S 6020-MS1	22778.69	1
Thallium	CAL3	S 6020-MS2	44091.45	2
Thallium	CAL4	S 6020-MS3	3006076	125
Thallium	CAL5	S 6020-MS4	5646920	250
Thallium	CAL6	S 6020-MS5	1.072388E+07	500
Vanadium	CAL1	S0	4487.947	0
Vanadium	CAL2	S 6020-MS1	103931.2	5
Vanadium	CAL3	S 6020-MS2	195195.4	10
Vanadium	CAL4	S 6020-MS3	2720837	125
Vanadium	CAL5	S 6020-MS4	4931022	250
Vanadium	CAL6	S 6020-MS5	9647104	500
Zinc	CAL1	S0	249.077	0
Zinc	CAL2	S 6020-MS1	4652.008	2
Zinc	CAL3	S 6020-MS2	8872.454	4
Zinc	CAL4	S 6020-MS3	296953	125
Zinc	CAL5	S 6020-MS4	593065.2	250
Zinc	CAL6	S 6020-MS5	1182811	500

INITIAL CALIBRATION DATA (Continued)

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Antimony	0.002228	0	0.9999	0.998	
Arsenic	0.001206	0	0.9994	0.998	
Barium	0.0009696	0	0.9997	0.998	
Beryllium	0.001811	0	0.9997	0.998	
Cadmium	0.0007179	0	0.9999	0.998	
Chromium	0.006870	0	0.9999	0.998	
Cobalt	0.008309	0	0.9999	0.998	
Copper	0.003892	0	0.9994	0.998	
Lead	0.008481	0	0.9999	0.998	
Nickel	0.001734	0	0.9997	0.998	
Selenium	0.0001078	0	0.9990	0.998	
Silver	0.003416	0	0.9999	0.998	
Vanadium	0.007959	0	0.9998	0.998	
Zinc	0.0009687	0	0.9996	0.998	

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D27008-ICV1	Mercury	4.000	3.98	100	ug/L		+/-20
CCV	5D27008-CCV1	Mercury	5.000	4.98	100	ug/L		+/-20
CCV	5D27008-CCV2	Mercury	5.000	4.84	97	ug/L		+/-20
CCV	5D27008-CCV3	Mercury	5.000	5.02	100	ug/L		+/-20
CCV	5D27008-CCV4	Mercury	5.000	5.34	107	ug/L		+/-20

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28008 Instrument ID: C2

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D28008-ICV1	Cyanide	250.0	273	109	ug/L		+/-15
CCV	5D28008-CCV1	Cyanide	200.0	205	103	ug/L		+/-15
CCV	5D28008-CCV2	Cyanide	200.0	205	103	ug/L		+/-15
CCV	5D28008-CCV3	Cyanide	200.0	203	102	ug/L		+/-15

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D30007-ICV1	Antimony	220.0	206	94	ug/L		+/-10
ICV	5D30007-ICV1	Arsenic	220.0	205	93	ug/L		+/-10
ICV	5D30007-ICV1	Barium	110.0	109	99	ug/L		+/-10
ICV	5D30007-ICV1	Beryllium	110.0	107	97	ug/L		+/-10
ICV	5D30007-ICV1	Cadmium	110.0	104	95	ug/L		+/-10
ICV	5D30007-ICV1	Chromium	110.0	104	94	ug/L		+/-10
ICV	5D30007-ICV1	Cobalt	110.0	106	97	ug/L		+/-10
ICV	5D30007-ICV1	Copper	110.0	105	96	ug/L		+/-10
ICV	5D30007-ICV1	Lead	220.0	212	96	ug/L		+/-10
ICV	5D30007-ICV1	Nickel	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Selenium	220.0	203	93	ug/L		+/-10
ICV	5D30007-ICV1	**Silver**	**110.0**	**98.8**	90	**ug/L**		+/-10
ICV	5D30007-ICV1	Thallium	220.0	214	97	ug/L		+/-10
ICV	5D30007-ICV1	Vanadium	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Zinc	220.0	204	93	ug/L		+/-10
CCV	5D30007-CCV1	Antimony	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV1	Arsenic	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV1	Barium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV1	Beryllium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV1	Cadmium	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV1	Chromium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV1	Cobalt	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Copper	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV1	Lead	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV1	Selenium	300.0	277	93	ug/L		+/-10
CCV	5D30007-CCV1	Silver	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV1	Thallium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV1	Vanadium	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV1	Zinc	300.0	274	91	ug/L		+/-10
CCV	5D30007-CCV2	Antimony	300.0	275	92	ug/L		+/-10
CCV	5D30007-CCV2	Arsenic	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV2	Barium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Beryllium	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV2	Cadmium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV2	Chromium	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV2	Cobalt	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Copper	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV2	Lead	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV2	Nickel	300.0	288	96	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV2	Selenium	300.0	274	91	ug/L		+/-10
CCV	5D30007-CCV2	Silver	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV2	Thallium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV2	Vanadium	300.0	311	104	ug/L		+/-10
CCV	5D30007-CCV2	Zinc	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Antimony	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV3	Arsenic	300.0	275	92	ug/L		+/-10
CCV	5D30007-CCV3	Barium	300.0	284	95	ug/L		+/-10
CCV	5D30007-CCV3	Beryllium	300.0	321	107	ug/L		+/-10
CCV	5D30007-CCV3	Cadmium	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV3	Chromium	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV3	Cobalt	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Copper	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV3	Lead	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV3	Nickel	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV3	Selenium	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV3	Silver	300.0	278	93	ug/L		+/-10
CCV	5D30007-CCV3	Thallium	300.0	301	100	ug/L		+/-10
CCV	5D30007-CCV3	Vanadium	300.0	302	101	ug/L		+/-10
CCV	5D30007-CCV3	Zinc	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV4	Antimony	300.0	270	90	ug/L		+/-10
CCV	5D30007-CCV4	Arsenic	300.0	280	93	ug/L		+/-10
CCV	5D30007-CCV4	Barium	300.0	287	96	ug/L		+/-10
CCV	5D30007-CCV4	Beryllium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV4	Cadmium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV4	Chromium	300.0	313	104	ug/L		+/-10
CCV	5D30007-CCV4	Cobalt	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Copper	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV4	Lead	300.0	286	95	ug/L		+/-10
CCV	5D30007-CCV4	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Selenium	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV4	Silver	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV4	Thallium	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV4	Vanadium	300.0	312	104	ug/L		+/-10
CCV	5D30007-CCV4	Zinc	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV5	Antimony	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV5	Arsenic	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV5	Barium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV5	Beryllium	300.0	317	106	ug/L		+/-10
CCV	5D30007-CCV5	Cadmium	300.0	281	94	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV5	Chromium	300.0	316	105	ug/L		+/-10
CCV	5D30007-CCV5	Cobalt	300.0	307	102	ug/L		+/-10
CCV	5D30007-CCV5	Copper	300.0	307	102	ug/L		+/-10
CCV	5D30007-CCV5	Lead	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV5	Nickel	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV5	Selenium	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV5	Silver	300.0	277	93	ug/L		+/-10
CCV	5D30007-CCV5	Thallium	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV5	Vanadium	300.0	317	106	ug/L		+/-10
CCV	5D30007-CCV5	Zinc	300.0	302	101	ug/L		+/-10
CCV	5D30007-CCV6	Antimony	300.0	287	96	ug/L		+/-10
CCV	5D30007-CCV6	Arsenic	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV6	Barium	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV6	Beryllium	300.0	326	109	ug/L		+/-10
CCV	5D30007-CCV6	Cadmium	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV6	Chromium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV6	Cobalt	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV6	Copper	300.0	304	101	ug/L		+/-10
CCV	5D30007-CCV6	Lead	300.0	305	102	ug/L		+/-10
CCV	5D30007-CCV6	Nickel	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV6	Selenium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV6	Silver	300.0	278	93	ug/L		+/-10
CCV	5D30007-CCV6	Thallium	300.0	306	102	ug/L		+/-10
CCV	5D30007-CCV6	Vanadium	300.0	308	103	ug/L		+/-10
CCV	5D30007-CCV6	Zinc	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV7	Antimony	300.0	306	102	ug/L		+/-10
CCV	5D30007-CCV7	Arsenic	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV7	Barium	300.0	301	100	ug/L		+/-10
CCV	5D30007-CCV7	Beryllium	300.0	318	106	ug/L		+/-10
CCV	5D30007-CCV7	Cadmium	300.0	286	96	ug/L		+/-10
CCV	5D30007-CCV7	Chromium	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV7	Cobalt	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV7	Copper	300.0	276	92	ug/L		+/-10
CCV	5D30007-CCV7	Lead	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV7	Nickel	300.0	271	91	ug/L		+/-10
CCV	5D30007-CCV7	Selenium	300.0	278	93	ug/L		+/-10
CCV	5D30007-CCV7	Silver	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV7	Thallium	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV7	Vanadium	300.0	286	96	ug/L		+/-10
CCV	5D30007-CCV7	Zinc	300.0	279	93	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV8	Antimony	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV8	Arsenic	300.0	284	95	ug/L		+/-10
CCV	5D30007-CCV8	Barium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV8	Beryllium	300.0	315	105	ug/L		+/-10
CCV	5D30007-CCV8	Cadmium	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV8	Chromium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV8	Cobalt	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV8	Copper	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV8	Lead	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV8	Nickel	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV8	Selenium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV8	Silver	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV8	Thallium	300.0	304	101	ug/L		+/-10
CCV	5D30007-CCV8	Vanadium	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV8	Zinc	300.0	278	93	ug/L		+/-10

LOW RANGE STANDARD

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES **SDG:** 1504090 **Project:** RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5D28008-LCV1 **Sequence:** 5D28008 **Standard ID:** 5D28005

ANALYTE	TRUE (ug/L)	FOUND (ug/L)	% Rec	Q	QC LIMIT
Cyanide	40.00	38.6	97	J	90-110

* Values outside of QC limits

HIGH RANGE STANDARD

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES **SDG:** 1504090 **Project:** RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5D28008-HCV1 **Sequence:** 5D28008 **Standard ID:** 5D28004

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% Rec	Q	QC LIMIT
Cyanide	300.0	285	95.0		90-110

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units
ICSA	5D30007-IFA1	Antimony		0.00	4	ug/L
ICSA	5D30007-IFA1	Arsenic		-0.10	20	ug/L
ICSA	5D30007-IFA1	Barium		0.03	20	ug/L
ICSA	5D30007-IFA1	Beryllium		0.05	2	ug/L
ICSA	5D30007-IFA1	Cadmium		0.03	2	ug/L
ICSA	5D30007-IFA1	Chromium		0.06	10	ug/L
ICSA	5D30007-IFA1	Cobalt		0.02	10	ug/L
ICSA	5D30007-IFA1	Copper		0.10	10	ug/L
ICSA	5D30007-IFA1	Lead		0.03	2	ug/L
ICSA	5D30007-IFA1	Nickel		0.13	20	ug/L
ICSA	5D30007-IFA1	Selenium		-0.51	10	ug/L
ICSA	5D30007-IFA1	Silver		0.00	2	ug/L
ICSA	5D30007-IFA1	Thallium		0.02	2	ug/L
ICSA	5D30007-IFA1	Vanadium		-0.01	20	ug/L
ICSA	5D30007-IFA1	Zinc		0.20	20	ug/L
ICSAB	5D30007-IFB1	Antimony		-0.07	4	ug/L
ICSAB	5D30007-IFB1	Arsenic	25.00	22.42	90	ug/L
ICSAB	5D30007-IFB1	Barium		0.04	20	ug/L
ICSAB	5D30007-IFB1	Beryllium		0.03	2	ug/L
ICSAB	5D30007-IFB1	Cadmium	25.00	22.74	91	ug/L
ICSAB	5D30007-IFB1	Chromium	50.00	46.81	94	ug/L
ICSAB	5D30007-IFB1	Cobalt	50.00	45.15	90	ug/L
ICSAB	5D30007-IFB1	Copper	50.00	47.52	95	ug/L
ICSAB	5D30007-IFB1	Lead		0.01	2	ug/L
ICSAB	5D30007-IFB1	Nickel	50.00	48.25	97	ug/L
ICSAB	5D30007-IFB1	Selenium	25.00	21.69	87	ug/L
ICSAB	5D30007-IFB1	Silver	12.50	11.26	90	ug/L
ICSAB	5D30007-IFB1	Thallium		0.00	2	ug/L
ICSAB	5D30007-IFB1	Vanadium	50.00	47.78	96	ug/L
ICSAB	5D30007-IFB1	Zinc	25.00	22.49	90	ug/L

* The absence of an entry in the “True” column denotes the lack of a true value for that analyte. The entry in the “%R” column represents a Control Limit, established as +/- 2 times analyte Limit Reporting Limit.

ICP-MS Tune

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Date: 04/30/15 ICP-MS Instrument ID: PEMS

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9	8.925	0.684	10	0.802
Mg - 24	23.925	0.688	10	0.729
Mg - 25	24.975	0.704	10	0.58
Mg - 26	25.975	0.746	10	0.868
Co - 59	58.925	0.694	10	1.243
In - 113	112.925	0.674	10	1.014
In - 115	114.925	0.700	10	0.855
Pb - 206	205.975	0.700	10	0.715
Pb - 207	206.975	0.693	10	0.867
Pb - 208	207.975	0.689	10	1.39

Comments:

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504090

Sequence: 5D30007

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
S0	4/30/15 9:49	100	100	100	100	100
S 6020-MS1	4/30/15 9:50	98	102	99	101	102
S 6020-MS2	4/30/15 9:52	100	103	100	101	104
S 6020-MS3	4/30/15 9:54	108	106	104	105	110
S 6020-MS4	4/30/15 9:56	94	92	96	96	97
S 6020-MS5	4/30/15 9:58	94	94	88	91	95
LLICV	4/30/15 10:01	105	105	103	103	101
ICV	4/30/15 10:03	99	98	97	99	103
ICB	4/30/15 10:05	101	99	99	102	104
ICSA	4/30/15 10:06	102	99	97	101	102
ICSAB	4/30/15 10:08	97	101	98	101	102
LLCCV	4/30/15 10:10	99	99	97	99	102
CCV	4/30/15 10:12	100	99	97	101	99
CCB	4/30/15 10:14	100	100	99	96	101
LLCCV	4/30/15 10:33	110	102	96	102	101
CCV	4/30/15 10:35	110	95	92	100	100
CCB	4/30/15 10:37	107	92	95	100	100
CCV	4/30/15 11:08	105	96	100	105	104
CCB	4/30/15 11:09	108	100	102	110	106
PBWWR	4/30/15 11:15	113	97	103	108	111
MLCSWR	4/30/15 11:17	107	96	102	106	109
16WC1A	4/30/15 11:18	105	97	98	102	99
16WC1AD	4/30/15 11:20	100	93	94	101	94
16WC1AS	4/30/15 11:22	103	95	98	106	99
16WC1ASD	4/30/15 11:24	97	92	94	102	96
16WC1AL	4/30/15 11:26	102	97	98	109	105
LLCCV	4/30/15 11:27	103	96	104	108	109
CCV	4/30/15 11:29	110	96	102	112	108
CCB	4/30/15 11:31	112	99	106	110	113

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504090

Sequence: 5D30007

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
16WC1AA	4/30/15 11:56	101	90	94	97	89
16C1	4/30/15 11:58	109	93	100	105	99
16MW8	4/30/15 12:00	112	93	102	104	104
16MW9	4/30/15 12:01	103	90	96	101	93
16WDUP	4/30/15 12:03	106	92	97	104	98
16WC1B	4/30/15 12:05	112	98	106	116	111
CCV	4/30/15 12:14	105	95	107	113	111
CCB	4/30/15 12:16	108	97	108	112	114
LLCCV	4/30/15 12:32	107	98	112	115	115
CCV	4/30/15 12:33	102	100	110	113	109
CCB	4/30/15 12:35	103	96	110	114	109
CCV	4/30/15 13:16	111	109	108	109	113
CCB	4/30/15 13:18	109	107	109	115	116
16MW9	4/30/15 13:26	106	101	102	105	101
LLCCV	4/30/15 13:40	105	106	110	116	117
CCV	4/30/15 13:41	106	104	109	115	113
CCB	4/30/15 13:43	106	107	111	113	116

BLANKS

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D27008-ICB1	Mercury	0.00900	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB1	Mercury	0.00100	0.200	2.00	ug/L	*U*	EPA 7470A
PBWWM	5042403-BLK1	Mercury		0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB2	Mercury	-0.00200	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB3	Mercury	-0.00500	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB4	Mercury	-0.0100	0.200	2.00	ug/L	*U*	EPA 7470A

BLANKS

EPA 9010C/9012B

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28008 Instrument ID: C2

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D28008-ICB1	Cyanide	-3.73	4.00	20.0	ug/L	*U*	EPA 9010C/9012B
CCB	5D28008-CCB1	Cyanide	-2.46	4.00	20.0	ug/L	*U*	EPA 9010C/9012B
PBWWT	5042801-BLK1	Cyanide	-4.75	4.00	20.0	ug/L	*J*	EPA 9010C/9012B
CCB	5D28008-CCB2	Cyanide	-3.15	4.00	20.0	ug/L	*U*	EPA 9010C/9012B
CCB	5D28008-CCB3	Cyanide	-2.84	4.00	20.0	ug/L	*U*	EPA 9010C/9012B

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D30007-ICB1	Antimony	0.189	0.400	2.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Arsenic	-0.119	2.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Barium	0.0153	1.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Beryllium	0.00558	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cadmium	0.0168	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Chromium	-0.0167	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cobalt	0.00933	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Copper	0.00707	1.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Lead	0.0246	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Nickel	0.0124	2.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Selenium	-0.568	3.00	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Silver	0.0588	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Thallium	0.0342	0.200	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Vanadium	0.00535	1.00	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Zinc	0.0282	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Antimony	0.0895	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Arsenic	-0.0417	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Barium	0.144	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Beryllium	0.0232	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cadmium	0.0314	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Chromium	0.0151	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cobalt	0.0145	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Copper	0.0276	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Lead	0.0376	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Nickel	0.0369	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Selenium	-0.319	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Silver	0.166	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Thallium	0.0437	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Vanadium	0.0125	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Zinc	0.181	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Antimony	0.0561	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Arsenic	-0.0226	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Barium	0.103	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Beryllium	0.00202	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Cadmium	0.000970	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Chromium	-0.0291	1.00	5.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB2	Cobalt	0.00288	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Copper	0.0111	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Lead	0.0238	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Nickel	0.0358	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Selenium	-0.176	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Silver	0.126	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Thallium	0.0255	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Vanadium	-0.00719	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Zinc	0.201	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Antimony	0.0163	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Arsenic	0.107	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Barium	0.113	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Beryllium	0.0114	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Cadmium	0.00920	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Chromium	-0.131	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Cobalt	0.00579	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Copper	0.00462	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Lead	0.0227	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Nickel	0.0371	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Selenium	-0.0271	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Silver	0.103	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Thallium	0.0263	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Vanadium	-0.0303	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Zinc	0.178	3.00	10.0	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Antimony		0.400	2.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Arsenic		2.00	10.0	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Barium		1.00	10.0	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Beryllium		0.200	1.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Cadmium		0.200	1.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Chromium		1.00	5.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Cobalt		1.00	5.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Copper		1.00	5.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Lead		0.200	1.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Nickel		2.00	10.0	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Selenium		3.00	5.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Silver		0.200	1.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
PBWWR	5042418-BLK1	Thallium		0.200	1.00	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Vanadium		1.00	10.0	ug/L	U	EPA 6020A
PBWWR	5042418-BLK1	Zinc		3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Antimony	0.101	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Arsenic	0.186	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Barium	0.212	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Beryllium	0.0429	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Cadmium	0.0554	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Chromium	-0.0845	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Cobalt	0.0381	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Copper	0.0352	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Lead	0.0763	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Nickel	0.0644	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Selenium	0.149	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Silver	0.177	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Thallium	0.0779	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Vanadium	-0.000840	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Zinc	0.225	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Antimony	0.0289	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Arsenic	0.0152	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Barium	0.139	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Beryllium	0.00598	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Cadmium	0.0165	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Chromium	-0.0736	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Cobalt	0.0162	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Copper	0.0232	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Lead	0.0304	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Nickel	0.0601	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Selenium	-0.416	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Silver	0.152	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Thallium	0.0359	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Vanadium	-0.00827	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Zinc	0.253	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Antimony	0.0213	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Arsenic	-0.0296	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Barium	0.0626	1.00	10.0	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB6	Beryllium	0.0304	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Cadmium	0.0114	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Chromium	-0.00990	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Cobalt	0.0193	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Copper	0.0555	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Lead	0.0289	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Nickel	0.0731	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Selenium	-0.569	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Silver	0.106	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Thallium	0.0372	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Vanadium	0.000110	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB6	Zinc	0.149	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Antimony	0.0712	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Arsenic	-0.0227	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Barium	0.105	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Beryllium	0.0291	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Cadmium	0.0337	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Chromium	-0.113	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Cobalt	0.0335	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Copper	0.0257	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Lead	0.0536	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Nickel	0.0491	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Selenium	-0.618	3.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Silver	0.112	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Thallium	0.0655	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Vanadium	-0.00625	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB7	Zinc	0.141	3.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Antimony	0.0734	0.400	2.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Arsenic	-0.0305	2.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Barium	0.0809	1.00	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Beryllium	0.0240	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Cadmium	0.0235	0.200	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Chromium	-0.115	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Cobalt	0.0245	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Copper	0.0248	1.00	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB8	Lead	0.0390	0.200	1.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB8	Nickel	0.0511	2.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Selenium	-0.559	3.00	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Silver	0.117	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Thallium	0.0532	0.200	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Vanadium	-0.0248	1.00	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Zinc	0.134	3.00	10.0	ug/L	*U*	EPA 6020A

METALS/MERCURY PREPARATION LOG

Metals Method: 3010A / 6010C
Mercury Method: 7470A
Prepared By: SAB

CompuChem
A Division Of
Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 1030
Batch Number: 5042403
Blue Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042403-BLK1	PBWWM	MB			100	100	CS / CL		N/A
5042403-BS1	MLCSWM	LCS			100	100	CS / CL		N/A
5042403-BSD1	MLCSDWM	LCSD			100	100	CS / CL		N/A
5042403-DUP1	5W7BD	DUP			100	100	CS / CL		7.2
5042403-DUP2	16WC1AD	DUP			100	100	CS / CL		7.2
5042403-MS1	5W7BS	MS			100	100	CS / CL		7.2
5042403-MS2	16WC1AS	MS			100	100	CS / CL		7.2
5042403-MSD1	5W7BSD	MSD			100	100	CS / CL		7.2
5042403-MSD2	16WC1ASD	MSD			100	100	CS / CL		7.2
1504088-01	5W7B	SAMPLE			100	100	CS / CL		7.2
1504088-02	5W5B	SAMPLE			100	100	CS / CL		7.2
1504088-03	5WC21	SAMPLE			100	100	BR / CY		7.2
1504088-04	5WDUP	SAMPLE			100	100	BR / CY		7.2
1504088-05	5WC22	SAMPLE			100	100	BR / CY		7.2
1504088-06	5WC23	SAMPLE			100	100	BR / CY		7.2
1504090-01	16WC1A	SAMPLE			100	100	CS / CL		7.2
1504090-02	16C1	SAMPLE			100	100	CS / CL		7.2
1504090-03	16MW8	SAMPLE			100	100	CS / CL		7.2
1504090-04	16MW9	SAMPLE			100	100	CS / CL		7.2
1504090-05	16WDUP	SAMPLE			100	100	CS / CL		7.2
1504090-06	16WC1B	SAMPLE			100	100	CS / CL		7.2
1504091-01	16-2	SAMPLE			100	100	CS / CL		7.2
1504091-02	16-3	SAMPLE			100	100	CS / CL		7.2
1504091-03	16-5	SAMPLE			100	100	CS / CL		7.2
1504091-04	16WC2B	SAMPLE			100	100	CS / CL		7.2
1504091-05	16SPRING	SAMPLE			100	100	CS / CY		7.2

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached.

Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	C
Hot Block Temp Out:	C
Hot Block Identifier	
Time Hg in water bath:	1105
Time Hg out water bath:	1305
Water Bath Temp In:	92,93 C
Water Bath Temp Out:	92,93 C
Water Bath Identifier	Hg Baths 1+2

MS Reference
ICAP: 0.5 mL ICCV-6
Ref #:
ICAP: 0.5 mL ICCV-4
Ref#:
HG: 1.0mL 100ppb Hg
Ref# SD24005

LCS Reference
ICAP: 0.5mL ICCV-6
REF:
ICAP: 0.5mL ICCV-4
REF:
HG: 0.4 mL of HGMS-1PPM
Ref# 460107

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 4/24/15

JCF 111711

METALS/MERCURY PREPARATION LOG

Metals Method: 3005A / 6020A
Mercury Method: 7470A
Prepared By: SAB

Environmental Testing Laboratories — CompuChem — A Division Of Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 1500
Batch Number: 5042418

Purple Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042418-BLK1	PBWWR	MB	50 100	100			CS / CL	CS / CL	N/A
5042418-BS1	MLCSWR	LCS	5 100	100			CS / CL	CS / CL	N/A
5042418-DUP1	16WC1AD	DUP	100	100			CS / CL	CS / CL	12
5042418-MS1	16WC1AS	MS	100	100			CS / CL	CS / CL	12
5042418-MSD1	16WC1ASD	MSD	100	100			CS / CL	CS / CL	12
1504086-01	4-13-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504086-02	4-14-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504086-03	4-15-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504086-04	4-16-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504086-05	4-17-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504087-01	4-13-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504087-02	4-14-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504087-03	4-15-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504087-04	4-16-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504087-05	4-17-15	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-01	16WC1A	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-02	16C1	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-03	16MW8	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-04	16MW9	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-05	16WDUP	SAMPLE	100	100			CS / CL	CS / CL	12
1504090-06	16WC1B	SAMPLE	100	100			CS / CL	CS / CL	12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached.

Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	94 C
Hot Block Temp Out:	94 C
Hot Block Identifier	MSBLOCK#1
Time Hg in water bath:	
Time Hg out water bath:	
Water Bath Temp In:	C
Water Bath Temp Out:	C
Water Bath Identifier	

MS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4G01019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4G01018
HG: 1.0mL 100ppb Hg
Ref#

LCS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4G01019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4G01018
HG: 1.0 mL of ICCV-5
Ref#

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 04/26/15

111611 JCF

Cyanide Preparation

Worksheet: CN Prep

Method (Circle One): 335.2 CLP-M 335.4 (9010C/9012B) 4500-CN I ILM05.4-DW2 ILM05.4-DS2

Case/SDG:1504090/1504086 **Prepared By:** SAB **Date/Time:** 04-28-15/0910 **Batch:** 5042801

#	CCN (Lab ID)	Client ID	Initial (mL)	Final (mL)	Description Before	Description After	S-*	Cl2*	pH	Amen Prep**	Free Prep**
1	5042801-BLK1	PBWWT	50	50	CS/CL	CS/CL	ND	ND	N/A		
2	5042801-BS1	MLCSWT	50	50	CS/CL	CS/CL	ND	ND	N/A		
3	1504090-01	16WC1A	50	50	PS/CY	CS/CL	ND	ND	712		
4	5042801-DUP1	16WC1AD	50	50	CS/CY	CS/CL	ND	ND	712		
5	5042801-MS1	16WC1AS	50	50	CS/CY	CS/CL	ND	ND	712		
6	5042801-MSD1	16WC1ASD	50	50	CS/CY	CS/CL	ND	ND	712		
7	1504090-02	16C1	50	50	CS/CY	CS/CL	ND	ND	712		
8	1504090-03	16MW8	50	50	CS/CL	CS/CL	ND	ND	712		
9	1504090-04	16MW9	50	50	CS/CY	CS/CL	ND	ND	712		
10	1504090-05	16WDUP	50	50	CS/CL	CS/CL	ND	ND	712		
11	1504090-06	16WC1B	50	50	BR/CY	CS/CL	ND	ND	712		
12	1504086-03	4-15-15	50	50	BR/CL	CS/CL	ND	ND	712		
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
	SD28005	LRS	50	50	CS/CL	CS/CL	ND	ND	N/A		
	SD28004	HRS	50	50	CS/CL	CS/CL	ND	ND	N/A		
		MRS									
	SD28003	ICV-6	50	50	CS/CL	CS/CL	ND	ND	N/A		

MS/MSD Ref:	LRS Ref:	HRS Ref:	MRS Ref:	ICV Ref:	Distillation Start Time	0920
0.5 ml 10 ppm CN Ref ID: SD28001	0.2 ml 10 ppm CN Ref ID: SD28001	1.5 ml 10 ppm CN Ref ID: SD28001	1.0 ml 10 ppm CN Ref ID:	0.125 mL of 100 PPM CN Ref ID: SD28002	Distillation End Time	
					Temperature In:	125
					Temperature Out:	
				LCSW Ref:	CN Block Identifier	CN BLOCKS 1+3
				0.125 mL of 100 PPM CN Ref ID: SD28002	Chlorination Start Time	
					Chlorination End Time	

Reviewed By: [signature] Date: 4/28/15

Comments: _____

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black, GY=grey
F=fine M=medium C=coarse CL=clear, CY=cloudy, OP=opaque D= Dectected ND=Not Detected

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations require documentation documentation by the responsible chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out.

CompuChem
A Division Of
Liberty Analytical Corp.

4/30/2015

Abridged data package.
Full deliverable available
upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2013 UNIT 16 & 10/B03204-13

WorkOrder: 1504091

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13 **Sdg:** 1504091

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504091-01	16-2	Water	04/21/2015 12:00	04/23/2015 14:10
1504091-02	16-3	Water	04/21/2015 13:00	04/23/2015 14:10
1504091-03	16-5	Water	04/21/2015 14:10	04/23/2015 14:10
1504091-04	16WC2B	Water	04/22/2015 09:15	04/23/2015 14:10
1504091-05	16SPRING	Water	04/21/2015 14:30	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Laboratory: COMPUCHEM

SDG: 1504091

Client Sample Id:	Analysis:	Lab Sample Id:
16-2	EPA 7470A	1504091-01
16-2	EPA 6020A	1504091-01
16-3	EPA 7470A	1504091-02
16-3	EPA 6020A	1504091-02
16-3	EPA 6020A	1504091-02RE1
16-5	EPA 7470A	1504091-03
16-5	EPA 6020A	1504091-03
16WC2B	EPA 7470A	1504091-04
16WC2B	EPA 6020A	1504091-04
16SPRING	EPA 7470A	1504091-05
16SPRING	EPA 6020A	1504091-05

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 04/30/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1504091
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2013 UNIT 16 &10/B03204-13

The indicated Sample Delivery Group (SDG) consisting of five (5) water samples was received into the laboratory information management system (LIMS) on April 23, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The cooler temperature indicator bottle was found with the samples and the samples temperature was -0.1, -0.2, -0.4, and 0.7 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A/7470A methodology for the requested metals and mercury.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Barium for sample 16-2

$$\frac{206.8603\ \mu g/L\ (C) \times 0.10\ L\ (F)}{0.10\ L\ (I)} = 206.9\ \mu g/L \text{ reported as } 207\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW, LCSWD, & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

No matrix spikes were requested for these samples.

A five-fold serial dilution of sample, CCN = SDI1504091-01 (16-2L) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5042402-PS2 (16-2A) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
April 30, 2015

CHAIN OF CUSTODY RECORD

RUSH 4/16/15

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

Client: 0 **Attn:** 0 **Address:** 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU16 **Event:** 2Q 2015 Annual Groundwater Monitoring Event **OAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES **Carrier:** DASH COURIER **Tracking Number:**

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT **OTHER** _____
Preserved and shipped on ice: YES

Box 4 - Sample Type	G	G		G	G				
Box 3 - Filtered/Unfiltered	U	U		U	U				
Required pH of Sample	<2	<2			>12				
Box 2 - Preservative	B	B		H	E				
Box 5 - Sample Container Type	1-500 ml P			2-1L AG	1-500-P				

Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	ICP/MS 6020A/3005A (Metals-Total)	7470A (Mercury-Total)		8270D/3510C (Semivolatiles)	9012B/9010C(Cyanide)	metals pH	cyanide pH				
16C1	4/22	1510	GW	4	X	X		X	X	<2	>12	150409	0-	07	
16MW8		1015	GW	4	X	X		X	X	<2	>12		-	03	
16MW9		1130	GW	4	X	X		X	X	<2	>12		-	04	
16WC1A		1345	GW	10 12	X	X		X	X	<2	>12		-	01	(1) 500mL P container USE FOR QC for ms/msd/matrix spiked
16WDUP		1355	GW	4	X	X		X	X	<2	>12		-	05	
16WC1B		1240	GW	4	X	X		X	X	<2	>12		-	06	
16-2	4/21	1200	GW	3	X	X		X		<2		150409	1-	01	
16-3	4/21	1300	GW	3	X	X		X		<2			-	02	
16-5	4/21	1410	GW	3	X	X		X		<2			-	03	
16WC2B	4/22	0915	GW	3	X	X		X		<2			-	04	
16SPRING	4/21	1430	GW	3	X	X		X		<2			-	05	

GENERAL NOTES:
1. Report results to detection limit, with J flags, for italicized wells.
2. Report results at or greater than QL for non-italicized wells.
3. ERIS Deliverable required.
4. VELAP accreditation required.
5. Full deliverable.

Clients Special Instructions: Level 4 with edd. See attached target analyte list. 0.1°C, 0.7°C, -0.4°C, -0.1°C, 0.2°C, 0.1°C CN 16WC1B in (5) coolers @

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival ✓ Received on ice ✓ Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/21/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): TAYLOR	Date: 4/23/15	Sample Storage Time Requested:	
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1035	Company Name: DASH COURIER	Time: 1410		
Sampler Name (Print): Tyler Emery	Date: 4/21/15	#1 Received by (Signature): TAYLOR	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG	
Sampler Signature:	Time: 0800	Company Name: DASH	Time: 10:35	Company Name: CompuChem	Time: 1410		

1/8 JW 4/17/15

HOLDING TIME SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

SDG: 1504091

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16-2	04/21/15	04/23/15	04/24/15	04/30/15	9.0	180	
16-3	04/21/15	04/23/15	04/24/15	04/30/15	8.9	180	
16-3	04/21/15	04/23/15	04/24/15	04/30/15	9.0	180	
16-5	04/21/15	04/23/15	04/24/15	04/30/15	8.9	180	
16WC2B	04/22/15	04/23/15	04/24/15	04/30/15	8.1	180	
16SPRING	04/21/15	04/23/15	04/24/15	04/30/15	8.9	180	

HOLDING TIME SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

SDG: 1504091

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16-2	04/21/15	04/23/15	04/24/15	04/27/15	6.0	28	
16-3	04/21/15	04/23/15	04/24/15	04/27/15	5.9	28	
16-5	04/21/15	04/23/15	04/24/15	04/27/15	5.9	28	
16WC2B	04/22/15	04/23/15	04/24/15	04/27/15	5.1	28	
16SPRING	04/21/15	04/23/15	04/24/15	04/27/15	5.9	28	

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042402-BS1 Matrix: Water Client ID: MLCSWL Batch: 5042402

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Arsenic	220.0	195	88.8		80 - 120
Barium	110.0	107	97.1		80 - 120
Beryllium	110.0	104	94.4		80 - 120
Cadmium	110.0	102	92.6		80 - 120
Chromium	110.0	99.3	90.3		80 - 120
Cobalt	110.0	103	94.0		80 - 120
Copper	110.0	107	97.1		80 - 120
Lead	220.0	219	99.4		80 - 120
Nickel	110.0	108	98.0		80 - 120
Vanadium	110.0	102	92.3		80 - 120
Zinc	220.0	195	88.6		80 - 120

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042402-BSD1 Matrix: Water Client ID: MLCSDWL Batch: 5042402

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Arsenic	220.0	199	90.3	1.62	20		80 - 120
Barium	110.0	108	98.3	1.24	20		80 - 120
Beryllium	110.0	107	97.5	3.27	20		80 - 120
Cadmium	110.0	103	93.4	0.859	20		80 - 120
Chromium	110.0	104	94.8	4.91	20		80 - 120
Cobalt	110.0	107	96.9	2.97	20		80 - 120
Copper	110.0	103	94.1	3.12	20		80 - 120
Lead	220.0	212	96.5	2.95	20		80 - 120
Nickel	110.0	108	98.2	0.204	20		80 - 120
Vanadium	110.0	107	97.5	5.46	20		80 - 120
Zinc	220.0	199	90.7	2.30	20		80 - 120

LCS / LCS DUPLICATE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-BS1 Matrix: Water Client ID: MLCSWM Batch: 5042403

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Mercury	4.000	3.77	94		80 - 120

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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LCS / LCS DUPLICATE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042403-BSD1 Matrix: Water Client ID: MLCSDWM Batch: 5042403

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Mercury	4.000	3.88	97	3	20		80 - 120

SERIAL DILUTION

EPA 6020A

16-2L

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5D30007-SRD2 Matrix: Water Lab Source ID: 1504091-01 Source Sample: 16-2

Sequence: 5D30007 Dilution: 5 Report to MDL: NO

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Arsenic	10.00 U	50.00 U	10.0			EPA 6020A	10
Barium	206.86	206.93	10.0	0.0349		EPA 6020A	10
Beryllium	1.00 U	5.00 U	1.00			EPA 6020A	10
Cadmium	1.00 U	5.00 U	1.00			EPA 6020A	10
Chromium	5.00 U	25.00 U	5.00			EPA 6020A	10
Cobalt	5.00 U	25.00 U	5.00			EPA 6020A	10
Copper	5.00 U	25.00 U	5.00			EPA 6020A	10
Lead	1.00 U	5.00 U	1.00			EPA 6020A	10
Nickel	10.00 U	50.00 U	10.0			EPA 6020A	10
Vanadium	10.00 U	50.00 U	10.0			EPA 6020A	10
Zinc	10.00 U	50.00 U	10.0			EPA 6020A	10

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020A

16-2A

Laboratory: COMPUCHEM

Client: DRAPER ADEN ASSOCIATES

Matrix: Water

SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Laboratory ID: 5042402-PS2

Lab Source ID: 1504091-01

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Arsenic	8.95	U	10.00	89.5	75 - 125
Barium	294	207	100.0	86.9	75 - 125
Beryllium	9.61	U	10.00	96.1	75 - 125
Cadmium	9.26	U	10.00	92.6	75 - 125
Chromium	19.9	U	20.00	99.7	75 - 125
Cobalt	9.24	U	10.00	92.4	75 - 125
Copper	18.8	U	20.00	93.9	75 - 125
Lead	10.2	U	10.00	102	75 - 125
Nickel	10.5	U	10.00	105	75 - 125
Vanadium	49.5	U	50.00	98.9	75 - 125
Zinc	24.0	U	20.00	120	75 - 125

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Batch: 5042402 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16-2	1504091-01	04/24/15 09:40	100	100
16-3	1504091-02	04/24/15 09:40	100	100
16-3	1504091-02RE1	04/24/15 09:40	100	100
16-5	1504091-03	04/24/15 09:40	100	100
16WC2B	1504091-04	04/24/15 09:40	100	100
16SPRING	1504091-05	04/24/15 09:40	100	100
PBWWL	5042402-BLK1	04/24/15 09:40	100	100
MLCSWL	5042402-BS1	04/24/15 09:40	100	100
MLCSDWL	5042402-BSD1	04/24/15 09:40	100	100
16-2A	5042402-PS2	04/24/15 09:40	100	100

PREPARATION BATCH SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Batch: 5042403 Matrix: Water Preparation: EPA 7470A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16-2	1504091-01	04/24/15 10:30	100	100
16-3	1504091-02	04/24/15 10:30	100	100
16-5	1504091-03	04/24/15 10:30	100	100
16WC2B	1504091-04	04/24/15 10:30	100	100
16SPRING	1504091-05	04/24/15 10:30	100	100
PBWWM	5042403-BLK1	04/24/15 10:30	100	100
MLCSWM	5042403-BS1	04/24/15 10:30	100	100
MLCSDWM	5042403-BSD1	04/24/15 10:30	100	100

ANALYSIS SEQUENCE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Calibration: 5042801 Instrument: V4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
S0	5D27008-CAL1	5D27008_P-001	04/27/15 09:54:13
0.2	5D27008-CAL2	5D27008_P-002	04/27/15 09:57:16
S0.5	5D27008-CAL3	5D27008_P-003	04/27/15 10:00:17
S1.0	5D27008-CAL4	5D27008_P-004	04/27/15 10:02:56
S5.0	5D27008-CAL5	5D27008_P-005	04/27/15 10:05:25
S10.0	5D27008-CAL6	5D27008_P-006	04/27/15 10:08:07
ICV	5D27008-ICV1	5D27008_P-007	04/27/15 10:10:38
ICB	5D27008-ICB1	5D27008_P-008	04/27/15 10:14:50
CCV	5D27008-CCV1	5D27008_P-010	04/27/15 10:21:24
CCB	5D27008-CCB1	5D27008_P-011	04/27/15 10:24:32
PBWWM	5042403-BLK1	5D27008_P-012	04/27/15 10:27:20
MLCSWM	5042403-BS1	5D27008_P-013	04/27/15 10:30:19
MLCSDWM	5042403-BSD1	5D27008_P-014	04/27/15 10:32:56
CCV	5D27008-CCV2	5D27008_P-022	04/27/15 10:54:17
CCB	5D27008-CCB2	5D27008_P-023	04/27/15 10:56:56
CCV	5D27008-CCV3	5D27008_P-034	04/27/15 11:26:52
CCB	5D27008-CCB3	5D27008_P-035	04/27/15 11:29:22
16-2	1504091-01	5D27008_P-037	04/27/15 11:34:53
16-3	1504091-02	5D27008_P-038	04/27/15 11:37:25
16-5	1504091-03	5D27008_P-039	04/27/15 11:39:54
16WC2B	1504091-04	5D27008_P-040	04/27/15 11:42:26
16SPRING	1504091-05	5D27008_P-041	04/27/15 11:45:00
CCV	5D27008-CCV4	5D27008_P-046	04/27/15 12:00:12
CCB	5D27008-CCB4	5D27008_P-047	04/27/15 12:02:43

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
TUN1	5D30007-TUN1	5D30007_P-001	04/30/15 08:33:23
S0	5D30007-CAL1	5D30007_P-002	04/30/15 09:49:11
S 6020-MS1	5D30007-CAL2	5D30007_P-003	04/30/15 09:50:59
S 6020-MS2	5D30007-CAL3	5D30007_P-004	04/30/15 09:52:45
S 6020-MS3	5D30007-CAL4	5D30007_P-005	04/30/15 09:54:32
S 6020-MS4	5D30007-CAL5	5D30007_P-006	04/30/15 09:56:19
S 6020-MS5	5D30007-CAL6	5D30007_P-007	04/30/15 09:58:06
LLICV	5D30007-CRL1	5D30007_P-008	04/30/15 10:01:34
ICV	5D30007-ICV1	5D30007_P-009	04/30/15 10:03:22
ICB	5D30007-ICB1	5D30007_P-010	04/30/15 10:05:10
ICSA	5D30007-IFA1	5D30007_P-011	04/30/15 10:06:57
ICSAB	5D30007-IFB1	5D30007_P-012	04/30/15 10:08:44
LLCCV	5D30007-CRL2	5D30007_P-013	04/30/15 10:10:32
CCV	5D30007-CCV1	5D30007_P-014	04/30/15 10:12:20
CCB	5D30007-CCB1	5D30007_P-015	04/30/15 10:14:07
PBWWL	5042402-BLK1	5D30007_P-016	04/30/15 10:17:54
MLCSWL	5042402-BS1	5D30007_P-017	04/30/15 10:19:41
MLCSDWL	5042402-BSD1	5D30007_P-018	04/30/15 10:21:28
LLCCV	5D30007-CRL3	5D30007_P-025	04/30/15 10:33:58
CCV	5D30007-CCV2	5D30007_P-026	04/30/15 10:35:46
CCB	5D30007-CCB2	5D30007_P-027	04/30/15 10:37:33
16-2	1504091-01	5D30007_P-033	04/30/15 10:59:15
16-2L	5D30007-SRD2	5D30007_P-034	04/30/15 11:01:02
16-2A	5042402-PS2	5D30007_P-035	04/30/15 11:02:49
16-3	1504091-02	5D30007_P-036	04/30/15 11:04:36
16-5	1504091-03	5D30007_P-037	04/30/15 11:06:22
CCV	5D30007-CCV3	5D30007_P-038	04/30/15 11:08:11
CCB	5D30007-CCB3	5D30007_P-039	04/30/15 11:09:58
16WC2B	1504091-04	5D30007_P-040	04/30/15 11:11:46

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ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Calibration: 5043001 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
16SPRING	1504091-05	5D30007_P-041	04/30/15 11:13:33
LLCCV	5D30007-CRL4	5D30007_P-049	04/30/15 11:27:49
CCV	5D30007-CCV4	5D30007_P-050	04/30/15 11:29:37
CCB	5D30007-CCB4	5D30007_P-051	04/30/15 11:31:24
CCV	5D30007-CCV5	5D30007_P-062	04/30/15 12:14:17
CCB	5D30007-CCB5	5D30007_P-063	04/30/15 12:16:04
LLCCV	5D30007-CRL5	5D30007_P-072	04/30/15 12:32:08
CCV	5D30007-CCV6	5D30007_P-073	04/30/15 12:33:56
CCB	5D30007-CCB6	5D30007_P-074	04/30/15 12:35:43
CCV	5D30007-CCV7	5D30007_P-085	04/30/15 13:16:18
CCB	5D30007-CCB7	5D30007_P-086	04/30/15 13:18:05
16-3	1504091-02RE1	5D30007_P-090	04/30/15 13:29:28
LLCCV	5D30007-CRL6	5D30007_P-096	04/30/15 13:40:10
CCV	5D30007-CCV8	5D30007_P-097	04/30/15 13:41:59
CCB	5D30007-CCB8	5D30007_P-098	04/30/15 13:43:45

L. Target Element Results

(ANALYSIS DATA SHEETS)

ANALYSIS DATA SHEET

16-2

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504091-01 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic			10.0	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-39-3	Barium	207		10.0	1		EPA 6020A	5D30007	4/30/15 10:59
7440-41-7	Beryllium			1.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-43-9	Cadmium			1.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-47-3	Chromium			5.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-48-4	Cobalt			5.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-50-8	Copper			5.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7439-92-1	Lead			1.00	1	U	EPA 6020A	5D30007	4/30/15 10:59
7439-97-6	Mercury			2.00	1	U	EPA 7470A	5D27008	4/27/15 11:34
7440-02-0	Nickel			10.0	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-62-2	Vanadium			10.0	1	U	EPA 6020A	5D30007	4/30/15 10:59
7440-66-6	Zinc			10.0	1	U	EPA 6020A	5D30007	4/30/15 10:59

ANALYSIS DATA SHEET

16-3

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504091-02 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-39-3	Barium	695		20.0	2	D	EPA 6020A	5D30007	4/30/15 13:29
7440-41-7	Beryllium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-43-9	Cadmium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-47-3	Chromium			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-48-4	Cobalt			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-50-8	Copper			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7439-92-1	Lead			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:04
7439-97-6	Mercury			2.00	1	U	EPA 7470A	5D27008	4/27/15 11:37
7440-02-0	Nickel			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-62-2	Vanadium			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:04
7440-66-6	Zinc			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:04

ANALYSIS DATA SHEET

16-5

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504091-03 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-39-3	Barium	163		10.0	1		EPA 6020A	5D30007	4/30/15 11:06
7440-41-7	Beryllium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-43-9	Cadmium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-47-3	Chromium			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-48-4	Cobalt			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-50-8	Copper			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7439-92-1	Lead			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:06
7439-97-6	Mercury			2.00	1	U	EPA 7470A	5D27008	4/27/15 11:39
7440-02-0	Nickel			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-62-2	Vanadium			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:06
7440-66-6	Zinc			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:06

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ANALYSIS DATA SHEET

16WC2B

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504091-04 % Solid: Matrix: Water Sampled: 04/22/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-39-3	Barium	116		10.0	1		EPA 6020A	5D30007	4/30/15 11:11
7440-41-7	Beryllium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-43-9	Cadmium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-47-3	Chromium			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-48-4	Cobalt			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-50-8	Copper			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7439-92-1	Lead			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:11
7439-97-6	Mercury			2.00	1	U	EPA 7470A	5D27008	4/27/15 11:42
7440-02-0	Nickel			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-62-2	Vanadium			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:11
7440-66-6	Zinc			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:11

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ANALYSIS DATA SHEET

16SPRING

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 1504091-05 % Solid: Matrix: Water Sampled: 04/21/15 Received: 04/23/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-39-3	Barium	195		10.0	1		EPA 6020A	5D30007	4/30/15 11:13
7440-41-7	Beryllium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-43-9	Cadmium			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-47-3	Chromium			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-48-4	Cobalt			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-50-8	Copper			5.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7439-92-1	Lead			1.00	1	U	EPA 6020A	5D30007	4/30/15 11:13
7439-97-6	Mercury			2.00	1	U	EPA 7470A	5D27008	4/27/15 11:45
7440-02-0	Nickel			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-62-2	Vanadium			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:13
7440-66-6	Zinc			10.0	1	U	EPA 6020A	5D30007	4/30/15 11:13

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LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLICV	5D30007-CRL1	Arsenic	1.000	1.17	117	ug/L		70 - 130
LLICV	5D30007-CRL1	Barium	10.00	9.42	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Beryllium	1.000	0.984	98	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cadmium	1.000	0.936	94	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Chromium	2.000	1.99	100	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Cobalt	1.000	1.06	106	ug/L		70 - 130
LLICV	5D30007-CRL1	Copper	2.000	2.03	102	ug/L		70 - 130
LLICV	5D30007-CRL1	Lead	1.000	1.09	109	ug/L		70 - 130
LLICV	5D30007-CRL1	Nickel	1.000	1.10	110	ug/L		70 - 130
LLICV	5D30007-CRL1	Vanadium	5.000	4.75	95	ug/L	J	70 - 130
LLICV	5D30007-CRL1	Zinc	2.000	1.70	85	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Arsenic	1.000	0.875	88	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Barium	10.00	9.41	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Beryllium	1.000	0.930	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cadmium	1.000	0.927	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Chromium	2.000	1.85	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Cobalt	1.000	0.901	90	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Copper	2.000	1.89	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Lead	1.000	0.955	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Nickel	1.000	0.942	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Vanadium	5.000	4.74	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL2	Zinc	2.000	1.72	86	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Arsenic	1.000	0.748	75	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Barium	10.00	9.11	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Beryllium	1.000	0.917	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Chromium	2.000	1.72	86	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Cobalt	1.000	0.902	90	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Copper	2.000	1.84	92	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Lead	1.000	0.941	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Nickel	1.000	0.935	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Vanadium	5.000	4.56	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL3	Zinc	2.000	1.73	87	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Arsenic	1.000	1.05	105	ug/L		70 - 130
LLCCV	5D30007-CRL4	Barium	10.00	9.34	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Beryllium	1.000	0.950	95	ug/L	J	70 - 130

LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLCCV	5D30007-CRL4	Cadmium	1.000	0.906	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Chromium	2.000	1.90	95	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Cobalt	1.000	0.968	97	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Copper	2.000	1.95	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Lead	1.000	0.960	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Nickel	1.000	0.981	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL4	Vanadium	5.000	5.01	100	ug/L		70 - 130
LLCCV	5D30007-CRL4	Zinc	2.000	1.82	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Arsenic	1.000	0.850	85	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Barium	10.00	9.39	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Beryllium	1.000	0.969	97	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Cadmium	1.000	0.899	90	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Chromium	2.000	2.02	101	ug/L		70 - 130
LLCCV	5D30007-CRL5	Cobalt	1.000	1.01	101	ug/L		70 - 130
LLCCV	5D30007-CRL5	Copper	2.000	2.11	106	ug/L		70 - 130
LLCCV	5D30007-CRL5	Lead	1.000	0.959	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Nickel	1.000	1.10	110	ug/L		70 - 130
LLCCV	5D30007-CRL5	Vanadium	5.000	4.98	100	ug/L	J	70 - 130
LLCCV	5D30007-CRL5	Zinc	2.000	2.11	106	ug/L		70 - 130
LLCCV	5D30007-CRL6	Arsenic	1.000	0.909	91	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Barium	10.00	9.58	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Beryllium	1.000	1.07	107	ug/L		70 - 130
LLCCV	5D30007-CRL6	Cadmium	1.000	0.931	93	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Chromium	2.000	1.75	87	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Cobalt	1.000	0.942	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Copper	2.000	1.91	96	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Lead	1.000	0.995	100	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Nickel	1.000	0.983	98	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Vanadium	5.000	4.68	94	ug/L	J	70 - 130
LLCCV	5D30007-CRL6	Zinc	2.000	1.89	95	ug/L	J	70 - 130

INITIAL CALIBRATION DATA

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Mercury	CAL1	S0	-42	0
Mercury	CAL2	0.2	1014	0.2
Mercury	CAL3	S0.5	2514	0.5
Mercury	CAL4	S1.0	4831	1
Mercury	CAL5	S5.0	25642	5
Mercury	CAL6	S10.0	51082	10

INITIAL CALIBRATION DATA (Continued)

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5042801 Instrument: V4

Calibration Date: 4/27/2015 9:54:17

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Mercury	0.0001953	0.01519	0.9999	0.995	

INITIAL CALIBRATION DATA

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Arsenic	CAL1	S0	446.204	0
Arsenic	CAL2	S 6020-MS1	3062.335	1
Arsenic	CAL3	S 6020-MS2	5800.116	2
Arsenic	CAL4	S 6020-MS3	369236	125
Arsenic	CAL5	S 6020-MS4	752052.5	250
Arsenic	CAL6	S 6020-MS5	1466888	500
Barium	CAL1	S0	48.889	0
Barium	CAL2	S 6020-MS1	44368.78	10
Barium	CAL3	S 6020-MS2	84332.13	20
Barium	CAL4	S 6020-MS3	613986.2	125
Barium	CAL5	S 6020-MS4	1133056	250
Barium	CAL6	S 6020-MS5	2049108	500
Beryllium	CAL1	S0	3.333	0
Beryllium	CAL2	S 6020-MS1	330.561	1
Beryllium	CAL3	S 6020-MS2	692.246	2
Beryllium	CAL4	S 6020-MS3	46701.1	125
Beryllium	CAL5	S 6020-MS4	90208.43	250
Beryllium	CAL6	S 6020-MS5	182495.9	500
Cadmium	CAL1	S0	13.03	0
Cadmium	CAL2	S 6020-MS1	2876.564	1
Cadmium	CAL3	S 6020-MS2	5635.464	2
Cadmium	CAL4	S 6020-MS3	387923	125
Cadmium	CAL5	S 6020-MS4	750563.9	250
Cadmium	CAL6	S 6020-MS5	1375188	500
Chromium	CAL1	S0	13376.17	0
Chromium	CAL2	S 6020-MS1	47435.57	2
Chromium	CAL3	S 6020-MS2	78210.35	4

Chromium	CAL4	S 6020-MS3	2366082	125
Chromium	CAL5	S 6020-MS4	4147018	250
Chromium	CAL6	S 6020-MS5	8398229	500
Cobalt	CAL1	S0	107.778	0
Cobalt	CAL2	S 6020-MS1	20452.02	1
Cobalt	CAL3	S 6020-MS2	39849.8	2
Cobalt	CAL4	S 6020-MS3	2821096	125
Cobalt	CAL5	S 6020-MS4	5047868	250
Cobalt	CAL6	S 6020-MS5	1.012255E+07	500
Copper	CAL1	S0	340.747	0
Copper	CAL2	S 6020-MS1	19867.88	2
Copper	CAL3	S 6020-MS2	38239.66	4
Copper	CAL4	S 6020-MS3	1308376	125
Copper	CAL5	S 6020-MS4	2470642	250
Copper	CAL6	S 6020-MS5	4683799	500
Lead	CAL1	S0	447.229	0
Lead	CAL2	S 6020-MS1	23097.85	1
Lead	CAL3	S 6020-MS2	43958.66	2
Lead	CAL4	S 6020-MS3	3081202	125
Lead	CAL5	S 6020-MS4	5582773	250
Lead	CAL6	S 6020-MS5	1.0705E+07	500
Nickel	CAL1	S0	44.445	0
Nickel	CAL2	S 6020-MS1	4362.064	1
Nickel	CAL3	S 6020-MS2	8650.036	2
Nickel	CAL4	S 6020-MS3	614451.9	125
Nickel	CAL5	S 6020-MS4	1080344	250
Nickel	CAL6	S 6020-MS5	2091607	500
Vanadium	CAL1	S0	4487.947	0
Vanadium	CAL2	S 6020-MS1	103931.2	5
Vanadium	CAL3	S 6020-MS2	195195.4	10
Vanadium	CAL4	S 6020-MS3	2720837	125
Vanadium	CAL5	S 6020-MS4	4931022	250
Vanadium	CAL6	S 6020-MS5	9647104	500
Zinc	CAL1	S0	249.077	0
Zinc	CAL2	S 6020-MS1	4652.008	2

Zinc	CAL3	S 6020-MS2	8872.454	4
Zinc	CAL4	S 6020-MS3	296953	125
Zinc	CAL5	S 6020-MS4	593065.2	250
Zinc	CAL6	S 6020-MS5	1182811	500

INITIAL CALIBRATION DATA (Continued)

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5043001 Instrument: PEMS

Calibration Date: 4/30/2015 8:33:26

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Arsenic	0.001206	0	0.9994	0.998	
Barium	0.0009696	0	0.9997	0.998	
Beryllium	0.001811	0	0.9997	0.998	
Cadmium	0.0007179	0	0.9999	0.998	
Chromium	0.006870	0	0.9999	0.998	
Cobalt	0.008309	0	0.9999	0.998	
Copper	0.003892	0	0.9994	0.998	
Lead	0.008481	0	0.9999	0.998	
Nickel	0.001734	0	0.9997	0.998	
Vanadium	0.007959	0	0.9998	0.998	
Zinc	0.0009687	0	0.9996	0.998	

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D27008-ICV1	Mercury	4.000	3.98	100	ug/L		+/-20
CCV	5D27008-CCV1	Mercury	5.000	4.98	100	ug/L		+/-20
CCV	5D27008-CCV2	Mercury	5.000	4.84	97	ug/L		+/-20
CCV	5D27008-CCV3	Mercury	5.000	5.02	100	ug/L		+/-20
CCV	5D27008-CCV4	Mercury	5.000	5.34	107	ug/L		+/-20

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5D30007-ICV1	Arsenic	220.0	205	93	ug/L		+/-10
ICV	5D30007-ICV1	Barium	110.0	109	99	ug/L		+/-10
ICV	5D30007-ICV1	Beryllium	110.0	107	97	ug/L		+/-10
ICV	5D30007-ICV1	Cadmium	110.0	104	95	ug/L		+/-10
ICV	5D30007-ICV1	Chromium	110.0	104	94	ug/L		+/-10
ICV	5D30007-ICV1	Cobalt	110.0	106	97	ug/L		+/-10
ICV	5D30007-ICV1	Copper	110.0	105	96	ug/L		+/-10
ICV	5D30007-ICV1	Lead	220.0	212	96	ug/L		+/-10
ICV	5D30007-ICV1	Nickel	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Vanadium	110.0	110	100	ug/L		+/-10
ICV	5D30007-ICV1	Zinc	220.0	204	93	ug/L		+/-10
CCV	5D30007-CCV1	Arsenic	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV1	Barium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV1	Beryllium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV1	Cadmium	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV1	Chromium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV1	Cobalt	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Copper	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV1	Lead	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV1	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV1	Vanadium	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV1	Zinc	300.0	274	91	ug/L		+/-10
CCV	5D30007-CCV2	Arsenic	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV2	Barium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Beryllium	300.0	280	94	ug/L		+/-10
CCV	5D30007-CCV2	Cadmium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV2	Chromium	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV2	Cobalt	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV2	Copper	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV2	Lead	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV2	Nickel	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV2	Vanadium	300.0	311	104	ug/L		+/-10
CCV	5D30007-CCV2	Zinc	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Arsenic	300.0	275	92	ug/L		+/-10
CCV	5D30007-CCV3	Barium	300.0	284	95	ug/L		+/-10
CCV	5D30007-CCV3	Beryllium	300.0	321	107	ug/L		+/-10
CCV	5D30007-CCV3	Cadmium	300.0	283	94	ug/L		+/-10
CCV	5D30007-CCV3	Chromium	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV3	Cobalt	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV3	Copper	300.0	293	98	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV3	Lead	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV3	Nickel	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV3	Vanadium	300.0	302	101	ug/L		+/-10
CCV	5D30007-CCV3	Zinc	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV4	Arsenic	300.0	280	93	ug/L		+/-10
CCV	5D30007-CCV4	Barium	300.0	287	96	ug/L		+/-10
CCV	5D30007-CCV4	Beryllium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV4	Cadmium	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV4	Chromium	300.0	313	104	ug/L		+/-10
CCV	5D30007-CCV4	Cobalt	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Copper	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV4	Lead	300.0	286	95	ug/L		+/-10
CCV	5D30007-CCV4	Nickel	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV4	Vanadium	300.0	312	104	ug/L		+/-10
CCV	5D30007-CCV4	Zinc	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV5	Arsenic	300.0	299	100	ug/L		+/-10
CCV	5D30007-CCV5	Barium	300.0	291	97	ug/L		+/-10
CCV	5D30007-CCV5	Beryllium	300.0	317	106	ug/L		+/-10
CCV	5D30007-CCV5	Cadmium	300.0	281	94	ug/L		+/-10
CCV	5D30007-CCV5	Chromium	300.0	316	105	ug/L		+/-10
CCV	5D30007-CCV5	Cobalt	300.0	307	102	ug/L		+/-10
CCV	5D30007-CCV5	Copper	300.0	307	102	ug/L		+/-10
CCV	5D30007-CCV5	Lead	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV5	Nickel	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV5	Vanadium	300.0	317	106	ug/L		+/-10
CCV	5D30007-CCV5	Zinc	300.0	302	101	ug/L		+/-10
CCV	5D30007-CCV6	Arsenic	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV6	Barium	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV6	Beryllium	300.0	326	109	ug/L		+/-10
CCV	5D30007-CCV6	Cadmium	300.0	277	92	ug/L		+/-10
CCV	5D30007-CCV6	Chromium	300.0	303	101	ug/L		+/-10
CCV	5D30007-CCV6	Cobalt	300.0	298	99	ug/L		+/-10
CCV	5D30007-CCV6	Copper	300.0	304	101	ug/L		+/-10
CCV	5D30007-CCV6	Lead	300.0	305	102	ug/L		+/-10
CCV	5D30007-CCV6	Nickel	300.0	296	99	ug/L		+/-10
CCV	5D30007-CCV6	Vanadium	300.0	308	103	ug/L		+/-10
CCV	5D30007-CCV6	Zinc	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV7	Arsenic	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV7	Barium	300.0	301	100	ug/L		+/-10
CCV	5D30007-CCV7	Beryllium	300.0	318	106	ug/L		+/-10

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
CCV	5D30007-CCV7	Cadmium	300.0	286	96	ug/L		+/-10
CCV	5D30007-CCV7	Chromium	300.0	282	94	ug/L		+/-10
CCV	5D30007-CCV7	Cobalt	300.0	273	91	ug/L		+/-10
CCV	5D30007-CCV7	Copper	300.0	276	92	ug/L		+/-10
CCV	5D30007-CCV7	Lead	300.0	293	98	ug/L		+/-10
CCV	5D30007-CCV7	Nickel	300.0	271	91	ug/L		+/-10
CCV	5D30007-CCV7	Vanadium	300.0	286	96	ug/L		+/-10
CCV	5D30007-CCV7	Zinc	300.0	279	93	ug/L		+/-10
CCV	5D30007-CCV8	Arsenic	300.0	284	95	ug/L		+/-10
CCV	5D30007-CCV8	Barium	300.0	292	97	ug/L		+/-10
CCV	5D30007-CCV8	Beryllium	300.0	315	105	ug/L		+/-10
CCV	5D30007-CCV8	Cadmium	300.0	288	96	ug/L		+/-10
CCV	5D30007-CCV8	Chromium	300.0	294	98	ug/L		+/-10
CCV	5D30007-CCV8	Cobalt	300.0	289	96	ug/L		+/-10
CCV	5D30007-CCV8	Copper	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV8	Lead	300.0	297	99	ug/L		+/-10
CCV	5D30007-CCV8	Nickel	300.0	290	97	ug/L		+/-10
CCV	5D30007-CCV8	Vanadium	300.0	295	98	ug/L		+/-10
CCV	5D30007-CCV8	Zinc	300.0	278	93	ug/L		+/-10

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units
ICSA	5D30007-IFA1	Arsenic		-0.10	20	ug/L
ICSA	5D30007-IFA1	Barium		0.03	20	ug/L
ICSA	5D30007-IFA1	Beryllium		0.05	2	ug/L
ICSA	5D30007-IFA1	Cadmium		0.03	2	ug/L
ICSA	5D30007-IFA1	Chromium		0.06	10	ug/L
ICSA	5D30007-IFA1	Cobalt		0.02	10	ug/L
ICSA	5D30007-IFA1	Copper		0.10	10	ug/L
ICSA	5D30007-IFA1	Lead		0.03	2	ug/L
ICSA	5D30007-IFA1	Nickel		0.13	20	ug/L
ICSA	5D30007-IFA1	Vanadium		-0.01	20	ug/L
ICSA	5D30007-IFA1	Zinc		0.20	20	ug/L
ICSAB	5D30007-IFB1	Arsenic	25.00	22.42	90	ug/L
ICSAB	5D30007-IFB1	Barium		0.04	20	ug/L
ICSAB	5D30007-IFB1	Beryllium		0.03	2	ug/L
ICSAB	5D30007-IFB1	Cadmium	25.00	22.74	91	ug/L
ICSAB	5D30007-IFB1	Chromium	50.00	46.81	94	ug/L
ICSAB	5D30007-IFB1	Cobalt	50.00	45.15	90	ug/L
ICSAB	5D30007-IFB1	Copper	50.00	47.52	95	ug/L
ICSAB	5D30007-IFB1	Lead		0.01	2	ug/L
ICSAB	5D30007-IFB1	Nickel	50.00	48.25	97	ug/L
ICSAB	5D30007-IFB1	Vanadium	50.00	47.78	96	ug/L
ICSAB	5D30007-IFB1	Zinc	25.00	22.49	90	ug/L

* The absence of an entry in the “True” column denotes the lack of a true value for that analyte. The entry in the “%R” column represents a Control Limit, established as +/- 2 times analyte Limit Reporting Limit.

ICP-MS Tune

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Date: 04/30/15 ICP-MS Instrument ID: PEMS

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9	8.925	0.684	10	0.802
Mg - 24	23.925	0.688	10	0.729
Mg - 25	24.975	0.704	10	0.58
Mg - 26	25.975	0.746	10	0.868
Co - 59	58.925	0.694	10	1.243
In - 113	112.925	0.674	10	1.014
In - 115	114.925	0.700	10	0.855
Pb - 206	205.975	0.700	10	0.715
Pb - 207	206.975	0.693	10	0.867
Pb - 208	207.975	0.689	10	1.39

Comments:

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504091

Sequence: 5D30007

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
S0	4/30/15 9:49	100	100	100	100	100
S 6020-MS1	4/30/15 9:50	98	102	99	101	102
S 6020-MS2	4/30/15 9:52	100	103	100	101	104
S 6020-MS3	4/30/15 9:54	108	106	104	105	110
S 6020-MS4	4/30/15 9:56	94	92	96	96	97
S 6020-MS5	4/30/15 9:58	94	94	88	91	95
LLICV	4/30/15 10:01	105	105	103	103	101
ICV	4/30/15 10:03	99	98	97	99	103
ICB	4/30/15 10:05	101	99	99	102	104
ICSA	4/30/15 10:06	102	99	97	101	102
ICSAB	4/30/15 10:08	97	101	98	101	102
LLCCV	4/30/15 10:10	99	99	97	99	102
CCV	4/30/15 10:12	100	99	97	101	99
CCB	4/30/15 10:14	100	100	99	96	101
PBWWL	4/30/15 10:17	97	100	98	100	99
MLCSWL	4/30/15 10:19	98	99	99	100	96
MLCSDWL	4/30/15 10:21	95	97	98	103	99
LLCCV	4/30/15 10:33	110	102	96	102	101
CCV	4/30/15 10:35	110	95	92	100	100
CCB	4/30/15 10:37	107	92	95	100	100
16-2	4/30/15 10:59	110	94	93	98	94
16-2L	4/30/15 11:01	111	98	96	103	102
16-2A	4/30/15 11:02	106	92	91	98	94
16-3	4/30/15 11:04	113	95	93	102	100
16-5	4/30/15 11:06	111	95	93	101	98
CCV	4/30/15 11:08	105	96	100	105	104
CCB	4/30/15 11:09	108	100	102	110	106
16WC2B	4/30/15 11:11	101	90	90	97	96
16SPRING	4/30/15 11:13	109	95	98	105	99

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1504091

Sequence: 5D30007

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
LLCCV	4/30/15 11:27	103	96	104	108	109
CCV	4/30/15 11:29	110	96	102	112	108
CCB	4/30/15 11:31	112	99	106	110	113
CCV	4/30/15 12:14	105	95	107	113	111
CCB	4/30/15 12:16	108	97	108	112	114
LLCCV	4/30/15 12:32	107	98	112	115	115
CCV	4/30/15 12:33	102	100	110	113	109
CCB	4/30/15 12:35	103	96	110	114	109
CCV	4/30/15 13:16	111	109	108	109	113
CCB	4/30/15 13:18	109	107	109	115	116
16-3	4/30/15 13:29	111	105	110	111	109
LLCCV	4/30/15 13:40	105	106	110	116	117
CCV	4/30/15 13:41	106	104	109	115	113
CCB	4/30/15 13:43	106	107	111	113	116

BLANKS

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27008 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D27008-ICB1	Mercury	0.00900	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB1	Mercury	0.00100	0.200	2.00	ug/L	*U*	EPA 7470A
PBWWM	5042403-BLK1	Mercury	0.0170		2.00	ug/L	*J*	EPA 7470A
CCB	5D27008-CCB2	Mercury	-0.00200	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB3	Mercury	-0.00500	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5D27008-CCB4	Mercury	-0.0100	0.200	2.00	ug/L	*U*	EPA 7470A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5D30007-ICB1	Arsenic	-0.119	0.140	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Barium	0.0153	0.100	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Beryllium	0.00558	0.0330	1.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cadmium	0.0168	0.0110	1.00	ug/L	J	EPA 6020A
ICB	5D30007-ICB1	Chromium	-0.0167	0.0680	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Cobalt	0.00933	0.00950	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Copper	0.00707	0.120	5.00	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Lead	0.0246	0.0210	1.00	ug/L	J	EPA 6020A
ICB	5D30007-ICB1	Nickel	0.0124	0.00910	10.0	ug/L	J	EPA 6020A
ICB	5D30007-ICB1	Vanadium	0.00535	0.0560	10.0	ug/L	U	EPA 6020A
ICB	5D30007-ICB1	Zinc	0.0282	0.120	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Arsenic	-0.0417	0.140	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Barium	0.144	0.100	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB1	Beryllium	0.0232	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cadmium	0.0314	0.0110	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB1	Chromium	0.0151	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Cobalt	0.0145	0.00950	5.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB1	Copper	0.0276	0.120	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Lead	0.0376	0.0210	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB1	Nickel	0.0369	0.00910	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB1	Vanadium	0.0125	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB1	Zinc	0.181	0.120	10.0	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Arsenic	-0.0402		10.0	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Barium	0.00502		10.0	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Beryllium	0.00170		1.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Cadmium	-0.000700		1.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Chromium	-0.0167		5.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Cobalt	0.000430		5.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Copper	0.000180		5.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Lead	-0.00136		1.00	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Nickel	0.00296		10.0	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Vanadium	-0.00743		10.0	ug/L	J	EPA 6020A
PBWWL	5042402-BLK1	Zinc	0.0559		10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB2	Arsenic	-0.0226	0.140	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Barium	0.103	0.100	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB2	Beryllium	0.00202	0.0330	1.00	ug/L	U	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB2	Cadmium	0.000970	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Chromium	-0.0291	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Cobalt	0.00288	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Copper	0.0111	0.120	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Lead	0.0238	0.0210	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB2	Nickel	0.0358	0.00910	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB2	Vanadium	-0.00719	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB2	Zinc	0.201	0.120	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB3	Arsenic	0.107	0.140	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Barium	0.113	0.100	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB3	Beryllium	0.0114	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Cadmium	0.00920	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Chromium	-0.131	0.0680	5.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB3	Cobalt	0.00579	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Copper	0.00462	0.120	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Lead	0.0227	0.0210	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB3	Nickel	0.0371	0.00910	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB3	Vanadium	-0.0303	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB3	Zinc	0.178	0.120	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Arsenic	0.186	0.140	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Barium	0.212	0.100	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Beryllium	0.0429	0.0330	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Cadmium	0.0554	0.0110	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Chromium	-0.0845	0.0680	5.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Cobalt	0.0381	0.00950	5.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Copper	0.0352	0.120	5.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Lead	0.0763	0.0210	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Nickel	0.0644	0.00910	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB4	Vanadium	-0.000840	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB4	Zinc	0.225	0.120	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB5	Arsenic	0.0152	0.140	10.0	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Barium	0.139	0.100	10.0	ug/L	J	EPA 6020A
CCB	5D30007-CCB5	Beryllium	0.00598	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5D30007-CCB5	Cadmium	0.0165	0.0110	1.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB5	Chromium	-0.0736	0.0680	5.00	ug/L	J	EPA 6020A
CCB	5D30007-CCB5	Cobalt	0.0162	0.00950	5.00	ug/L	J	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB5	Copper	0.0232	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB5	Lead	0.0304	0.0210	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB5	Nickel	0.0601	0.00910	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB5	Vanadium	-0.00827	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB5	Zinc	0.253	0.120	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB6	Arsenic	-0.0296	0.140	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Barium	0.0626	0.100	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Beryllium	0.0304	0.0330	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Cadmium	0.0114	0.0110	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB6	Chromium	-0.00990	0.0680	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Cobalt	0.0193	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB6	Copper	0.0555	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Lead	0.0289	0.0210	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB6	Nickel	0.0731	0.00910	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB6	Vanadium	0.000110	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB6	Zinc	0.149	0.120	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Arsenic	-0.0227	0.140	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB7	Barium	0.105	0.100	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Beryllium	0.0291	0.0330	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB7	Cadmium	0.0337	0.0110	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Chromium	-0.113	0.0680	5.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Cobalt	0.0335	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Copper	0.0257	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB7	Lead	0.0536	0.0210	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Nickel	0.0491	0.00910	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB7	Vanadium	-0.00625	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB7	Zinc	0.141	0.120	10.0	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB8	Arsenic	-0.0305	0.140	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Barium	0.0809	0.100	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Beryllium	0.0240	0.0330	1.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Cadmium	0.0235	0.0110	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB8	Chromium	-0.115	0.0680	5.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB8	Cobalt	0.0245	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB8	Copper	0.0248	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Lead	0.0390	0.0210	1.00	ug/L	*J*	EPA 6020A
CCB	5D30007-CCB8	Nickel	0.0511	0.00910	10.0	ug/L	*J*	EPA 6020A

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D30007 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5D30007-CCB8	Vanadium	-0.0248	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5D30007-CCB8	Zinc	0.134	0.120	10.0	ug/L	*J*	EPA 6020A

METALS/MERCURY PREPARATION LOG

Metals Method: 3005A / 6020A
Mercury Method: 7470A
Prepared By: SAB

CompuChem
A Division Of
Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 0940
Batch Number: 5042402
Purple Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042402-BLK1	PBWWL	MB	100	100			CS CL	CS / CL	N/A
5042402-BS1	MLCSWL	LCS	100	100			CS / CL	CS / CL	N/A
5042402-BSD1	MLCSDWL	DUP	100	100			CS / CL	CS / CL	N/A
5042402-DUP1	5W7BD	MS	100	100			CS / CL	CS / CL	12
5042402-MS1	5W7BS	MSD	100	100			CS / CL	CS / CL	12
5042402-MSD1	5W7BSD	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-01	5W7B	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-02	5W5B	SAMPLE	100	100			CS / CL	CS / CL	12
1504088-03	5WC21	SAMPLE	100	100			BR / CY	BR / CY	12
1504088-04	5WDUP	SAMPLE	100	100			BR / CY	BR / CY	12
1504088-05	5WC22	SAMPLE	100	100			BR / CY	BR CY	12
1504088-06	5WC23	SAMPLE	100	100			BR / CY	BR / CY	12
1504091-01	16-2	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-02	16-3	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-03	16-5	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-04	16WC2B	SAMPLE	100	100			CS / CL	CS / CL	12
1504091-05	16SPRING	SAMPLE	100	100			CS / CY	Y / CY	12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	92 C
Hot Block Temp Out:	93 C
Hot Block Identifier	MJBLOCK#1
Time Hg in water bath:	
Time Hg out water bath:	
Water Bath Temp In:	C
Water Bath Temp Out:	C
Water Bath Identifier	

MS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018
HG: 1.0mL 100ppb Hg
Ref#

LCS Reference
ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #: 4GC1019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #: 4GC1018
HG: 1.0 mL of ICCV-5
Ref#

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By:
Date: 04/24/15

111611 JCF

METALS/MERCURY PREPARATION LOG

Metals Method: 3010A / 6010C
Mercury Method: 7470A
Prepared By: SAB

CompuChem
A Division Of
Liberty Analytical Corp.

Preparation Date: 04-24-15
Preparation Time: 1030
Batch Number: 5042403
Blue Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5042403-BLK1	PBWWM	MB			100	100	CS / CL		N/A
5042403-BS1	MLCSWM	LCS			100	100	CS / CL		N/A
5042403-BSD1	MLCSDWM	LCSD			100	100	CS / CL		N/A
5042403-DUP1	5W7BD	DUP			100	100	CS / CL		12
5042403-DUP2	16WC1AD	DUP			100	100	CS / CL		12
5042403-MS1	5W7BS	MS			100	100	CS / CL		12
5042403-MS2	16WC1AS	MS			100	100	CS / CL		12
5042403-MSD1	5W7BSD	MSD			100	100	CS / CL		12
5042403-MSD2	16WC1ASD	MSD			100	100	CS / CL		12
1504088-01	5W7B	SAMPLE			100	100	CS / CL		12
1504088-02	5W5B	SAMPLE			100	100	CS / CL		12
1504088-03	5WC21	SAMPLE			100	100	BR / CY		12
1504088-04	5WDUP	SAMPLE			100	100	BR / CY		12
1504088-05	5WC22	SAMPLE			100	100	BR / CY		12
1504088-06	5WC23	SAMPLE			100	100	BR / CY		12
1504090-01	16WC1A	SAMPLE			100	100	CS / CL		12
1504090-02	16C1	SAMPLE			100	100	CS / CL		12
1504090-03	16MW8	SAMPLE			100	100	CS / CL		12
1504090-04	16MW9	SAMPLE			100	100	CS / CL		12
1504090-05	16WDUP	SAMPLE			100	100	CS / CL		12
1504090-06	16WC1B	SAMPLE			100	100	CS / CL		12
1504091-01	16-2	SAMPLE			100	100	CS / CL		12
1504091-02	16-3	SAMPLE			100	100	CS / CL		12
1504091-03	16-5	SAMPLE			100	100	CS / CL		12
1504091-04	16WC2B	SAMPLE			100	100	CS / CL		12
1504091-05	16SPRING	SAMPLE			100	100	CS / CY		12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached.

Standard QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time	
Hot Block Temp In:	C
Hot Block Temp Out:	C
Hot Block Identifier	
Time Hg in water bath:	1105
Time Hg out water bath:	1305
Water Bath Temp In:	92,93 C
Water Bath Temp Out:	92,93 C
Water Bath Identifier	Hg Baths 1+2

MS Reference
ICAP: 0.5 mL ICCV-6
Ref #:
ICAP: 0.5 mL ICCV-4
Ref#:
HG: 1.0mL 100ppb Hg
Ref# SD24005

LCS Reference
ICAP: 0.5mL ICCV-6
REF:
ICAP: 0.5mL ICCV-4
REF:
HG: 0.4 mL of HGMS-1PPM
Ref# 460107

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: S. Bolton
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 4/24/15

JCF 111711

CompuChem
A Division Of
Liberty Analytical Corp.

6/4/2015

Abridged data package.
Full deliverable available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13
WorkOrder: 1505062

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1505062

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13 **Sdg:** 1505062

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1505062-01	16MW9	Water	05/26/2015 10:20	05/27/2015 10:04
1505062-02	16WC1A	Water	05/26/2015 11:25	05/27/2015 10:04

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Laboratory: COMPUCHEM

SDG: 1505062

Client Sample Id:	Analysis:	Lab Sample Id:
16MW9	EPA 6020A	1505062-01
16WC1A	EPA 6020A	1505062-02

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 06/04/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
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Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1505062
Client: DRAPER
Project: RAAP 2015 UNIT 16/Cobalt only verification/B03204-13

The indicated Sample Delivery Group (SDG) consisting of two (2) water samples were received into the laboratory information management system (LIMS) on May 27, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The cooler temperature indicator bottle was found with the sample and the samples temperature was 0.2 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A methodology for the requested metal cobalt.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Cobalt for sample 16MW9

$$\frac{4.84423\ \mu g/L\ (C) \times 0.05\ L\ (F)}{0.05\ L\ (I)} = 4.844\ \mu g/L \text{ reported as } 4.84\ J\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW, LCSWD, & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

No matrix spikes were requested for these samples.

A five-fold serial dilution of sample, CCN = SDI1505062-01 (16MW9L) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5052908-PS1 (16MW9A) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
June 4, 2015

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

✓ NVR 5-22-15

Client: 0 **Attn:** 0 **Address:** 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU16 **Event:** 2015 - 1st Semiannual Ground Water Verification Event **DAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES UPS: **Carrier:** 12.237.301.01.9015.3673 **Tracking Number:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Box 4: Sample Type
G Grab; C Composite

Invoice
Copy to Consultant: YES
Bill: CLIENT **OTHER** _____
Preserved and shipped on ice: YES

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample					<2								
Box 2 - Preservative					B								
Box 5 - Sample Container Type					1-250mL P								
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**ICP/MS 6020A/3005A (Metals-Cobalt ONLY)**	metals pH							
16MW9	5/26	1020	GW	1	X	<2		1505062-01					
16WC1A	5/26	1125	GW	1	X	<2		✓ -02					

GENERAL NOTES:
1. Full deliverable, standard turnaround.
2. Report Cobalt QL (5ug/l), permit DL (1ug/l).
3. Estimated results.

✓

Clients Special Instructions:

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival 0.2°C Received on Ice ✓ Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CIDDINGTON	Date: 5/26/15	#1 Relinquished by (Signature):	Date: 5/26/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print): MICHAEL NELSON	Date: 5/26/15	#1 Received by (Signature):	Date: 5/27/15	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0800	Company Name: CompuChem/LIBERTY	Time: 1004	Company Name:	Time:	

✓ KD 5/27/15 NVR 5-22-15 1/1

HOLDING TIME SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

SDG: 1505062

Sample Name	Date Collected	Date Received	Date Prepared	Date Analyzed	Days to Analysis	Max Days to Analysis*	Q
16MW9	05/26/15	05/27/15	06/01/15	06/03/15	8.4	180	
16WC1A	05/26/15	05/27/15	06/01/15	06/03/15	8.4	180	

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METHOD DETECTION AND REPORTING LIMITS

Laboratory: COMPUCHEM **SDG:** 1505062

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Cobalt	1	5.00	ug/L	EPA 6020A

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LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Lab ID: 5052908-BS1 Matrix: Water Client ID: MLCSYI Batch: 5052908

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	105	95.0		80 - 120

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Lab ID: 5052908-BSD1 Matrix: Water Client ID: MLCSDYI Batch: 5052908

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Cobalt	110.0	104	94.4	0.628	20		80 - 120

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SERIAL DILUTION

EPA 6020A

16MW9L

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Lab ID: 5F03011-SRD2 Matrix: Water Lab Source ID: 1505062-01 Source Sample: 16MW9

Sequence: 5F03011 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Cobalt	4.84 J	5.03 J	5.00	3.81		EPA 6020A	10

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POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020A

16MW9A

Laboratory: COMPUCHEM
SDG: 1505062
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2015 UNIT16/Cobalt only verfication/B0320
Matrix: Water
Laboratory ID: 5052908-PS1
Lab Source ID: 1505062-01

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Cobalt	13.6	4.84 J	10.00	87.7	75 - 125

PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Batch: 5052908 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16MW9	1505062-01	06/01/15 16:10	50.0	50.0
16WC1A	1505062-02	06/01/15 16:10	50.0	50.0
PBWYI	5052908-BLK1	06/01/15 16:10	50.0	50.0
MLCSYI	5052908-BS1	06/01/15 16:10	50.0	50.0
MLCSDYI	5052908-BSD1	06/01/15 16:10	50.0	50.0
16MW9A	5052908-PS1	06/01/15 16:10	50.0	50.0

ANALYSIS SEQUENCE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Calibration: 5060401 Instrument: PEMS

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
TUNE	5F03011-TUN1	5F03011_P-001	06/03/15 19:04:07
S0	5F03011-CAL1	5F03011_P-002	06/03/15 19:25:11
S 6020-MS1	5F03011-CAL2	5F03011_P-003	06/03/15 19:26:59
S 6020-MS2	5F03011-CAL3	5F03011_P-004	06/03/15 19:28:46
S 6020-MS3	5F03011-CAL4	5F03011_P-005	06/03/15 19:30:33
S 6020-MS4	5F03011-CAL5	5F03011_P-006	06/03/15 19:32:19
S 6020-MS5	5F03011-CAL6	5F03011_P-007	06/03/15 19:34:06
LLICV	5F03011-CRL1	5F03011_P-008	06/03/15 19:37:34
ICV	5F03011-ICV1	5F03011_P-009	06/03/15 19:39:23
ICB	5F03011-ICB1	5F03011_P-010	06/03/15 19:41:10
ICSA	5F03011-IFA1	5F03011_P-011	06/03/15 19:42:58
ICSAB	5F03011-IFB1	5F03011_P-012	06/03/15 19:44:44
LLCCV	5F03011-CRL2	5F03011_P-013	06/03/15 19:46:32
CCV	5F03011-CCV1	5F03011_P-014	06/03/15 19:48:21
CCB	5F03011-CCB1	5F03011_P-015	06/03/15 19:50:07
PBWYI	5052908-BLK1	5F03011_P-016	06/03/15 19:52:30
MLCSYI	5052908-BS1	5F03011_P-017	06/03/15 19:54:17
MLCSDYI	5052908-BSD1	5F03011_P-018	06/03/15 19:56:04
16MW9	1505062-01	5F03011_P-021	06/03/15 20:01:25
16MW9L	5F03011-SRD2	5F03011_P-022	06/03/15 20:03:12
16MW9A	5052908-PS1	5F03011_P-023	06/03/15 20:04:59
16WC1A	1505062-02	5F03011_P-024	06/03/15 20:06:45
CCV	5F03011-CCV2	5F03011_P-026	06/03/15 20:10:21
CCB	5F03011-CCB2	5F03011_P-027	06/03/15 20:12:08
LLCCV	5F03011-CRL3	5F03011_P-037	06/03/15 20:30:00
CCV	5F03011-CCV3	5F03011_P-038	06/03/15 20:31:48
CCB	5F03011-CCB3	5F03011_P-039	06/03/15 20:33:35

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L. Target Element Results

(ANALYSIS DATA SHEETS)

ANALYSIS DATA SHEET

16MW9

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Lab ID: 1505062-01 % Solid: Matrix: Water Sampled: 05/26/15 Received: 05/27/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	4.84	1.00	5.00	1	J	EPA 6020A	5F03011	6/3/15 20:01

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ANALYSIS DATA SHEET

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Lab ID: 1505062-02 % Solid: Matrix: Water Sampled: 05/26/15 Received: 05/27/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	4.30	1.00	5.00	1	J	EPA 6020A	5F03011	6/3/15 20:06

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LOW LEVEL INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	QC Limts
LLICV	5F03011-CRL1	Cobalt	1.000	1.03	103	ug/L		70 - 130
LLCCV	5F03011-CRL2	Cobalt	1.000	1.01	101	ug/L		70 - 130
LLCCV	5F03011-CRL3	Cobalt	1.000	0.957	96	ug/L	U	70 - 130

INITIAL CALIBRATION DATA

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Calibration: 5060401 Instrument: PEMS

Calibration Date: 6/3/2015 19:04:25

Compound	QC Sample	Lab ID	Area	Conc (ug/L)
Cobalt	CAL1	S0	106.112	0
Cobalt	CAL2	S 6020-MS1	16437.39	1
Cobalt	CAL3	S 6020-MS2	31361.96	2
Cobalt	CAL4	S 6020-MS3	1962497	125
Cobalt	CAL5	S 6020-MS4	3916421	250
Cobalt	CAL6	S 6020-MS5	7580958	500

INITIAL CALIBRATION DATA (Continued)

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Calibration: 5060401 Instrument: PEMS

Calibration Date: 6/3/2015 19:04:25

Compound	Slope	Intercept	Linear r	Linear Limit	Q
Cobalt	0.01075	0	0.9999	0.998	

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units	Q	Control Limit
ICV	5F03011-ICV1	Cobalt	110.0	108	98	ug/L		+/-10
CCV	5F03011-CCV1	Cobalt	300.0	293	98	ug/L		+/-10
CCV	5F03011-CCV2	Cobalt	300.0	280	94	ug/L		+/-10
CCV	5F03011-CCV3	Cobalt	300.0	285	95	ug/L		+/-10

ICP INTERFERENCE CHECK SAMPLE

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	True	Found	%R	Units
ICSA	5F03011-IFA1	Cobalt		0.01	10	ug/L
ICSAB	5F03011-IFB1	Cobalt	50.00	48.61	97	ug/L

* The absence of an entry in the “True” column denotes the lack of a true value for that analyte. The entry in the “%R” column represents a Control Limit, established as +/- 2 times analyte Limit Reporting Limit.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ICP-MS Tune

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Date: 06/03/15 ICP-MS Instrument ID: PEMS

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9	8.975	0.719	10	1.255
Mg - 24	23.975	0.647	10	2.788
Mg - 25	24.975	0.692	10	2.825
Mg - 26	25.975	0.652	10	1.929
Co - 59	58.925	0.675	10	0.439
In - 113	112.975	0.715	10	0.951
In - 115	114.875	0.697	10	0.583
Pb - 206	206.025	0.703	10	1.714
Pb - 207	206.975	0.706	10	2.025
Pb - 208	207.975	0.730	10	2.611

Comments:

ICPMS Internal Standards Relative Intensity Summary

EPA 6020A

Client: DRAPER ADEN ASSOCIATES

Work Order: 1505062

Sequence: 5F03011

Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Instrument: PEMS

Sample No.	Time	Internal Standards %RI For: Lithium6	Scandium45	Indium115	Terbium159	Bismuth209
S0	6/3/15 19:25	100	100	100	100	100
S 6020-MS1	6/3/15 19:26	101	101	103	100	98
S 6020-MS2	6/3/15 19:28	98	99	99	98	98
S 6020-MS3	6/3/15 19:30	96	97	98	97	93
S 6020-MS4	6/3/15 19:32	94	96	97	97	95
S 6020-MS5	6/3/15 19:34	94	94	97	97	90
LLICV	6/3/15 19:37	93	97	97	99	96
ICV	6/3/15 19:39	98	98	101	100	98
ICB	6/3/15 19:41	98	100	105	104	104
ICSA	6/3/15 19:42	98	103	101	101	101
ICSAB	6/3/15 19:44	98	103	103	103	100
LLCCV	6/3/15 19:46	97	106	108	104	103
CCV	6/3/15 19:48	95	102	100	100	93
CCB	6/3/15 19:50	98	103	103	101	100
PBWYI	6/3/15 19:52	97	104	105	101	102
MLCSYI	6/3/15 19:54	96	105	106	105	101
MLCSDYI	6/3/15 19:56	94	104	101	100	98
16MW9	6/3/15 20:01	111	109	100	100	86
16MW9L	6/3/15 20:03	112	110	108	104	103
16MW9A	6/3/15 20:04	106	110	96	95	80
16WC1A	6/3/15 20:06	108	111	99	96	86
CCV	6/3/15 20:10	105	108	105	103	101
CCB	6/3/15 20:12	110	110	109	105	107
LLCCV	6/3/15 20:30	112	111	107	105	102
CCV	6/3/15 20:31	106	103	103	103	98
CCB	6/3/15 20:33	108	106	107	105	103

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1505062 Project: RAAP 2015 UNIT16/Cobalt only verfication/B03204-13

Sequence: 5F03011 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5F03011-ICB1	Cobalt	0.00206	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5F03011-CCB1	Cobalt	0.00219	1.00	5.00	ug/L	*U*	EPA 6020A
PBWYI	5052908-BLK1	Cobalt		1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5F03011-CCB2	Cobalt	0.0000500	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5F03011-CCB3	Cobalt	0.000690	1.00	5.00	ug/L	*U*	EPA 6020A

METALS/MERCURY PREPARATION LOG

Metals Method: 3005A / 6020A
Mercury Method: 7470A
Prepared By: JCF

CompuChem
A Division Of
Liberty Analytical Corp

Preparation Date: 060115
Preparation Time: 1610
Batch Number: 5052908
Purple Water

COMPUCHEM SAMPLE ID	CLIENT SAMPLE ID	SAMPLE TYPE	ICP Initial (mL)	ICP Final (mL)	HG Initial (mL)	HG Final (mL)	*Description Before	*Description After ICP	pH
5052908-BLK1	PBWYI	PBW	50	50			CS/CL	CS/CL	NA
5052908-BS1	MLCSYI	LCSW	50	50			CS/CL	CS/CL	NA
5052908-BSD1	MLCSDYI	LCSWD	50	50			CS/CL	CS/CL	12
1505050-01	PIPE	SAMPLE	50	50			CS/CL	CS/CL	12
1505062-01	16MW9	SAMPLE	50	50			CS/CL	CS/CL	12
1505062-02	16WC1A	SAMPLE	50	50			CS/CL	CS/CL	12
1505063-01	16MW9 DUP	SAMPLE	50	50			CS/CL	CS/CL	12
1505063-02	16WC1A DUP	SAMPLE	50	50			CS/CL	CS/CL	12
1505067-01	5-18-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505067-02	5-19-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505067-03	5-20-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505067-04	5-21-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505067-05	5-22-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505068-01	5-18-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505068-02	5-19-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505068-03	5-20-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505068-04	5-21-15	SAMPLE	50	50			CS/CL	CS/CL	12
1505068-05	5-22-15	SAMPLE	50	50			CS/CL	CS/CL	12

Mercury Standards and QC S0 S0.2 S0.5S1 S5 S10 ICV ICB CRI CCV CCB

NOTE: All standards and QC for mercury were prepared at the same day as the associated samples. Refer to the attached Standard/QC Preparation Log, with date matching the above preparation date, for preparation method and instruction.

Record of Tempature/Time		
Hot Block Temp In:	95	C
Hot Block Temp Out:	95	C
Hot Block Identifier	Hot Block #2	
Time Hg in water bath:		
Time Hg out water bath:		
Water Bath Temp In:		C
Water Bath Temp Out:		C
Water Bath Identifier		

MS Reference

ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref #:
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref #:
HG: 1.0mL 100ppb Hg
Ref#

LCS Reference

ICAP: 0.2 mL of ICCV-6
0.1 mL for 50 ml prep
Ref # 4G01019
ICAP: 0.2 mL of ICCV-4
0.1 mL for 50 ml prep
Ref # 4G01019
HG: 1.0 mL of ICCV-5
Ref#

* R=red, BL=blue, Y=yellow, G=green, O=orange, V=violet, W=white, CS=colorless, BR=brown, BK=black
GY= grey, F=fine, M=medium, C=coarse, CL=clear, CY=cloudy, OP=opaque

Shading has been applied to unused portions of this worksheet as a substitute for 'Z-out'.

"The presence of the Chemist's/analyst's employee ID number, or signature, on this log attests that strict compliance with the method's SOP has occurred. Any SOP deviations requires documentation by the chemist/analyst together with the chemist's/analyst's initials and the initials of the lab supervisor and a QA department representative, signifying approval of the deviation."

Sample Verification Signature: JCF
This signature corroborates that the sample idenification numbers appearing on the digestion cups are the same as those appearing on the field sample containers.

Reviewed By: [signature]
Date: 6/2/16

111611 JCF

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Abridged data package.
Full deliverable available upon request.

Type I Data Package

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

Project: RAAP - Radford, VA - HWMU16
Groundwater and Water Samples
Collected on 04/21/15-04/22/15

SDG# RAE37

GROUP	SAMPLE NUMBERS
1555749	7859332-7859346

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date: 05/12/2015**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Barbara Weyandt at (717) 556-7264.

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Sample Reference List for SDG Number RAE37
with a Data Package Type of I

11200 - Draper Aden Associates, Inc.

Project: RAAP - Radford, VA - HWMU16

Lab Sample Number	Lab Sample Code	Client Sample Description
7859332	16C1-	16C1 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859333	16MW8	16MW8 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859334	16MW9	16MW9 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859335	16C1A	16WC1A Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859336	16C1A	16WC1A MS Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859337	16C1A	16WC1A MSD Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859338	16CFD	16WDUP Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859339	16C1B	16WC1B Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859340	16C2-	16-2 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859341	16C3-	16-3 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859342	16C5-	16-5 Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859343	16C2B	16WC2B Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859344	16CSP	16SPRING Grab Groundwater 2Q 2015 Annual Groundwater Monitoring Ev
7859345	16TB1	Trip Blank_1 Water 2Q 2015 Annual Groundwater Monitoring Ev
7859346	16TB2	Trip Blank_2 Water 2Q 2015 Annual Groundwater Monitoring Ev

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Sample pH Log

SDG: RAE37

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #
7859332	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859332	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859332	038E	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859333	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859333	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859334	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859334	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859334	038E	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859335	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859335	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859336	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859336	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859336	038E	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859337	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859337	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859337	038E	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859338	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859338	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859339	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859339	038D	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859340	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859341	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859342	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859343	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859344	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859345	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
7859346	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

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01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030C, May 2003.

11996 VOCs- 25ml Water by 8260C
11997 VOCs- 5ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

May 08, 2015

Project: RAAP - Radford, VA - HWMU16

Submittal Date: 04/23/2015
Group Number: 1555749
SDG: RAE37
State of Sample Origin: VA

Client Sample Description	Lancaster Labs (LL) #
16C1 Grab Groundwater	7859332
16MW8 Grab Groundwater	7859333
16MW9 Grab Groundwater	7859334
16WC1A Grab Groundwater	7859335
16WC1A MS Grab Groundwater	7859336
16WC1A MSD Grab Groundwater	7859337
16WDUP Grab Groundwater	7859338
16WC1B Grab Groundwater	7859339
16-2 Grab Groundwater	7859340
16-3 Grab Groundwater	7859341
16-5 Grab Groundwater	7859342
16WC2B Grab Groundwater	7859343
16SPRING Grab Groundwater	7859344
Trip Blank_1 Water	7859345
Trip Blank_2 Water	7859346

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Kathy Olsen
ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Janet Frazier

Respectfully Submitted,

Barbara Weyandt

Barbara A. Weyandt
Specialist

(717) 556-7264

Project Name: RAAP - Radford, VA - HWMU16
LL Group #: 1555749

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 7859336, 7859337

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

Sample #s: 7859333, 7859335, 7859338, 7859339

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.
A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

Sample #s: 7859332, 7859334

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.
A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.
The concentration reported for ethyl ether is estimated since it exceeds the calibration range of the instrument in the initial determination, but is less than the quantitation limit in the further dilution. The result reported is from the initial/further diluted determination.

Sample Description: 16C1 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859332
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 15:10 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1- SDG#: RAE37-01

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	0.3	J	0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	4.9		0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	0.2	J	0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.6		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	0.3	J	0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	11	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	44	J	11	130	10
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	2.6		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16C1 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859332
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 15:10 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1- SDG#: RAE37-01

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Propionitrile	107-12-0	N.D.		10	100	1
11996	Styrene	100-42-5	N.D.		0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.		0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.		0.2	1.0	1
11996	Tetrachloroethene	127-18-4	0.3	J	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	14	J	2.0	25	1
11996	Toluene	108-88-3	N.D.		0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.		0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	0.3	J	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.		0.1	1.0	1
11996	Trichloroethene	79-01-6	0.3	J	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.		0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.		0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.		3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.		0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.		0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

The concentration reported for ethyl ether is estimated since it exceeds the calibration range of the instrument in the initial determination, but is less than the quantitation limit in the further dilution. The result reported is from the initial/further diluted determination.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 04:25	Sara E Johnson	1
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 04:47	Sara E Johnson	10
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 16:33	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 16:33	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 04:25	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	3	H151241AA	05/05/2015 04:47	Sara E Johnson	10

*=This limit was used in the evaluation of the final result

Sample Description: 16MW8 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859333
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 10:15 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16MW8 SDG#: RAE37-02

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	N.D.		0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	N.D.		0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	0.3	J	0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	0.3	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	7.7	J	1.1	13	1
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16MW8 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859333
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 10:15 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16MW8 SDG#: RAE37-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Propionitrile	107-12-0	N.D.	10	100	1
11996	Styrene	100-42-5	N.D.	0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.	0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1.0	1
11996	Tetrachloroethene	127-18-4	N.D.	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	N.D.	2.0	25	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	N.D.	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.	0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.	0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.	3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.	0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 01:34	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 16:55	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 16:55	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 01:34	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16MW9 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859334
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 11:30 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16MW9 SDG#: RAE37-03

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	0.3	J	0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	2.7		0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.9		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	1.1	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	50	J	11	130	10
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16MW9 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859334
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 11:30 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16MW9 SDG#: RAE37-03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Propionitrile	107-12-0	N.D.	10	100	1
11996	Styrene	100-42-5	N.D.	0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.	0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1.0	1
11996	Tetrachloroethene	127-18-4	N.D.	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	N.D.	2.0	25	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	N.D.	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.	0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.	0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.	3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.	0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

The concentration reported for ethyl ether is estimated since it exceeds the calibration range of the instrument in the initial determination, but is less than the quantitation limit in the further dilution. The result reported is from the initial/further diluted determination.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 05:08	Sara E Johnson	1
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 05:29	Sara E Johnson	10
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 17:17	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 17:17	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 05:08	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	3	H151241AA	05/05/2015 05:29	Sara E Johnson	10

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859335
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04BKG

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	0.1	J	0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	0.9	J	0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	2.4		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	1.0	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	14		1.1	13	1
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859335
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04BKG

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Propionitrile	107-12-0	N.D.	10	100	1
11996	Styrene	100-42-5	N.D.	0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.	0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1.0	1
11996	Tetrachloroethene	127-18-4	N.D.	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	N.D.	2.0	25	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	N.D.	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.	0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.	0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.	3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.	0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/04/2015 23:47	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 17:40	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 17:40	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/04/2015 23:47	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A MS Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859336
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04MS

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l		ug/l	ug/l	
11996	Acetone	67-64-1	34		3.0	10	1
11996	Acetonitrile	75-05-8	47	J	32	100	1
11996	Acrolein	107-02-8	27		5.0	25	1
11996	Acrylonitrile	107-13-1	26		1.0	10	1
11996	Allyl Chloride	107-05-1	5.4	J	0.8	10	1
11996	Benzene	71-43-2	5.1		0.1	1.0	1
11996	Bromodichloromethane	75-27-4	4.8		0.1	1.0	1
11996	Bromoform	75-25-2	4.4		0.1	1.0	1
11996	Bromomethane	74-83-9	4.6		0.5	1.0	1
11996	2-Butanone	78-93-3	38		1.0	10	1
11996	Carbon Disulfide	75-15-0	5.1	J	0.4	10	1
11996	Carbon Tetrachloride	56-23-5	5.1		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	4.4	J	0.5	10	1
11996	Chloroethane	75-00-3	5.5		0.1	1.0	1
11996	Chloroform	67-66-3	5.0		0.1	1.0	1
11996	Chloromethane	74-87-3	4.4		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	4.5		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	5.0		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	5.0		0.1	1.0	1
11996	Dibromomethane	74-95-3	4.8		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	27		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	4.8		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	4.9		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	4.9		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	3.9		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.2		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	4.8		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	5.3		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	5.2		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	5.0		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	5.0		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	5.0		0.1	1.0	1
11996	Dimethyl ether	115-10-6	5.7	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	140	J	45	200	1
11996	Ethyl ether	60-29-7	17		1.1	13	1
11996	Ethyl Methacrylate	97-63-2	4.7	J	0.8	10	1
11996	Ethylbenzene	100-41-4	5.1		0.1	1.0	1
11996	Freon 113	76-13-1	5.2		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	4.5		0.1	1.0	1
11996	Hexachloroethane	67-72-1	5.6	J	0.1	10	1
11996	2-Hexanone	591-78-6	26		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	130	J	10	200	1
11996	Methacrylonitrile	126-98-7	40	J	9.8	100	1
11996	Methyl Iodide	74-88-4	4.9	J	0.6	10	1
11996	Methyl Methacrylate	80-62-6	5.1	J	3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	26		1.0	10	1
11996	Methylene Chloride	75-09-2	5.0		0.2	1.0	1
11996	Naphthalene	91-20-3	3.9		0.1	1.0	1
11996	Pentachloroethane	76-01-7	5.1	J	0.8	10	1
11997	2-Propanol	67-63-0	140		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A MS Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859336
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04MS

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l		ug/l	ug/l	
11996	Propionitrile	107-12-0	38	J	10	100	1
11996	Styrene	100-42-5	5.1		0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	5.0		0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	5.1		0.2	1.0	1
11996	Tetrachloroethene	127-18-4	5.2		0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	26		2.0	25	1
11996	Toluene	108-88-3	5.1		0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	4.2		0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	4.9		0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	5.1		0.1	1.0	1
11996	Trichloroethene	79-01-6	5.2		0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	4.9		0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	4.9		0.3	1.0	1
11996	Vinyl Acetate	108-05-4	13		3.3	10	1
11996	Vinyl Chloride	75-01-4	4.9		0.2	1.0	1
11996	Xylene (Total)	1330-20-7	15		0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 00:09	Sara E Johnson	1
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 00:51	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 18:02	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 18:02	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 00:09	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	3	H151241AA	05/05/2015 00:51	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A MSD Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859337
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04MSD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l		ug/l	ug/l	
11996	Acetone	67-64-1	40		3.0	10	1
11996	Acetonitrile	75-05-8	48	J	32	100	1
11996	Acrolein	107-02-8	32		5.0	25	1
11996	Acrylonitrile	107-13-1	30		1.0	10	1
11996	Allyl Chloride	107-05-1	5.4	J	0.8	10	1
11996	Benzene	71-43-2	5.1		0.1	1.0	1
11996	Bromodichloromethane	75-27-4	4.7		0.1	1.0	1
11996	Bromoform	75-25-2	4.4		0.1	1.0	1
11996	Bromomethane	74-83-9	4.7		0.5	1.0	1
11996	2-Butanone	78-93-3	44		1.0	10	1
11996	Carbon Disulfide	75-15-0	5.1	J	0.4	10	1
11996	Carbon Tetrachloride	56-23-5	5.1		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	4.3	J	0.5	10	1
11996	Chloroethane	75-00-3	5.7		0.1	1.0	1
11996	Chloroform	67-66-3	5.0		0.1	1.0	1
11996	Chloromethane	74-87-3	4.4		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	5.4		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	4.9		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	5.1		0.1	1.0	1
11996	Dibromomethane	74-95-3	4.8		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	31		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	4.8		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	4.9		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	5.0		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	3.9		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.3		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	4.7		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	5.3		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	5.1		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	5.0		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	4.8		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	5.0		0.1	1.0	1
11996	Dimethyl ether	115-10-6	5.9	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	170	J	45	200	1
11996	Ethyl ether	60-29-7	18		1.1	13	1
11996	Ethyl Methacrylate	97-63-2	4.6	J	0.8	10	1
11996	Ethylbenzene	100-41-4	5.0		0.1	1.0	1
11996	Freon 113	76-13-1	5.1		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	4.7		0.1	1.0	1
11996	Hexachloroethane	67-72-1	5.8	J	0.1	10	1
11996	2-Hexanone	591-78-6	31		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	120	J	10	200	1
11996	Methacrylonitrile	126-98-7	46	J	9.8	100	1
11996	Methyl Iodide	74-88-4	4.9	J	0.6	10	1
11996	Methyl Methacrylate	80-62-6	6.1	J	3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	30		1.0	10	1
11996	Methylene Chloride	75-09-2	5.0		0.2	1.0	1
11996	Naphthalene	91-20-3	4.0		0.1	1.0	1
11996	Pentachloroethane	76-01-7	5.2	J	0.8	10	1
11997	2-Propanol	67-63-0	140		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1A MSD Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859337
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:45 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1A SDG#: RAE37-04MSD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l		ug/l	ug/l	
11996	Propionitrile	107-12-0	44	J	10	100	1
11996	Styrene	100-42-5	5.0		0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	4.9		0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	5.1		0.2	1.0	1
11996	Tetrachloroethene	127-18-4	5.1		0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	28		2.0	25	1
11996	Toluene	108-88-3	5.0		0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	4.3		0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	4.9		0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	5.0		0.1	1.0	1
11996	Trichloroethene	79-01-6	5.2		0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	5.0		0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	5.0		0.3	1.0	1
11996	Vinyl Acetate	108-05-4	13		3.3	10	1
11996	Vinyl Chloride	75-01-4	4.9		0.2	1.0	1
11996	Xylene (Total)	1330-20-7	15		0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 00:30	Sara E Johnson	1
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 01:13	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 18:25	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 18:25	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 00:30	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	3	H151241AA	05/05/2015 01:13	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WDUP Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859338
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:55 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16CFD SDG#: RAE37-05FD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	0.1	J	0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	0.8	J	0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	2.2		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	1	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	13		1.1	13	1
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WDUP Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859338
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 13:55 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16CFD SDG#: RAE37-05FD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	Propionitrile	107-12-0	N.D.	10	100	1
11996	Styrene	100-42-5	N.D.	0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.	0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1.0	1
11996	Tetrachloroethene	127-18-4	N.D.	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	N.D.	2.0	25	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	N.D.	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.	0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.	0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.	3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.	0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 01:55	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 18:47	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 18:47	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 01:55	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1B Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859339
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 12:40 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1B SDG#: RAE37-06

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**		**ug/l**	**ug/l**	
11996	Acetone	67-64-1	N.D.		3.0	10	1
11996	Acetonitrile	75-05-8	N.D.		32	100	1
11996	Acrolein	107-02-8	N.D.		5.0	25	1
11996	Acrylonitrile	107-13-1	N.D.		1.0	10	1
11996	Allyl Chloride	107-05-1	N.D.		0.8	10	1
11996	Benzene	71-43-2	N.D.		0.1	1.0	1
11996	Bromodichloromethane	75-27-4	N.D.		0.1	1.0	1
11996	Bromoform	75-25-2	N.D.		0.1	1.0	1
11996	Bromomethane	74-83-9	N.D.		0.5	1.0	1
11996	2-Butanone	78-93-3	N.D.		1.0	10	1
11996	Carbon Disulfide	75-15-0	N.D.		0.4	10	1
11996	Carbon Tetrachloride	56-23-5	N.D.		0.2	1.0	1
11996	2-Chloro-1,3-butadiene	126-99-8	N.D.		0.5	10	1
11996	Chloroethane	75-00-3	N.D.		0.1	1.0	1
11996	Chloroform	67-66-3	N.D.		0.1	1.0	1
11996	Chloromethane	74-87-3	N.D.		0.2	1.0	1
11996	1,2-Dibromo-3-chloropropane	96-12-8	N.D.		0.2	1.0	1
11996	Dibromochloromethane	124-48-1	N.D.		0.1	1.0	1
11996	1,2-Dibromoethane	106-93-4	N.D.		0.1	1.0	1
11996	Dibromomethane	74-95-3	N.D.		0.1	1.0	1
11996	trans-1,4-Dichloro-2-butene	110-57-6	N.D.		1.0	10	1
11996	1,2-Dichlorobenzene	95-50-1	N.D.		0.1	1.0	1
11996	1,3-Dichlorobenzene	541-73-1	N.D.		0.1	1.0	1
11996	1,4-Dichlorobenzene	106-46-7	N.D.		0.1	1.0	1
11996	Dichlorodifluoromethane	75-71-8	N.D.		0.1	1.0	1
11996	1,1-Dichloroethane	75-34-3	N.D.		0.1	1.0	1
11996	1,2-Dichloroethane	107-06-2	N.D.		0.1	1.0	1
11996	1,1-Dichloroethene	75-35-4	N.D.		0.2	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.		0.2	1.0	1
11996	1,2-Dichloropropane	78-87-5	N.D.		0.1	1.0	1
11996	1,3-Dichloropropane	142-28-9	N.D.		0.1	1.0	1
11996	trans-1,3-Dichloropropene	10061-02-6	N.D.		0.1	1.0	1
11996	Dimethyl ether	115-10-6	0.2	J	0.1	13	1
11996	1,4-Dioxane	123-91-1	N.D.		45	200	1
11996	Ethyl ether	60-29-7	N.D.		1.1	13	1
11996	Ethyl Methacrylate	97-63-2	N.D.		0.8	10	1
11996	Ethylbenzene	100-41-4	N.D.		0.1	1.0	1
11996	Freon 113	76-13-1	N.D.		0.2	1.0	1
11996	Hexachlorobutadiene	87-68-3	N.D.		0.1	1.0	1
11996	Hexachloroethane	67-72-1	N.D.		0.1	10	1
11996	2-Hexanone	591-78-6	N.D.		1.0	10	1
11996	Isobutyl Alcohol	78-83-1	N.D.		10	200	1
11996	Methacrylonitrile	126-98-7	N.D.		9.8	100	1
11996	Methyl Iodide	74-88-4	N.D.		0.6	10	1
11996	Methyl Methacrylate	80-62-6	N.D.		3.6	10	1
11996	4-Methyl-2-pentanone	108-10-1	N.D.		1.0	10	1
11996	Methylene Chloride	75-09-2	N.D.		0.2	1.0	1
11996	Naphthalene	91-20-3	N.D.		0.1	1.0	1
11996	Pentachloroethane	76-01-7	N.D.		0.8	10	1
11997	2-Propanol	67-63-0	N.D.		50	100	1

*=This limit was used in the evaluation of the final result

Sample Description: 16WC1B Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859339
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 12:40 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C1B SDG#: RAE37-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Propionitrile	107-12-0	N.D.	10	100	1
11996	Styrene	100-42-5	N.D.	0.1	1.0	1
11996	1,1,1,2-Tetrachloroethane	630-20-6	N.D.	0.1	1.0	1
11996	1,1,2,2-Tetrachloroethane	79-34-5	N.D.	0.2	1.0	1
11996	Tetrachloroethene	127-18-4	N.D.	0.1	1.0	1
11996	Tetrahydrofuran	109-99-9	N.D.	2.0	25	1
11996	Toluene	108-88-3	N.D.	0.1	1.0	1
11996	1,2,4-Trichlorobenzene	120-82-1	N.D.	0.1	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	N.D.	0.1	1.0	1
11996	1,1,2-Trichloroethane	79-00-5	N.D.	0.1	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Trichlorofluoromethane	75-69-4	N.D.	0.2	1.0	1
11996	1,2,3-Trichloropropane	96-18-4	N.D.	0.3	1.0	1
11996	Vinyl Acetate	108-05-4	N.D.	3.3	10	1
11996	Vinyl Chloride	75-01-4	N.D.	0.2	1.0	1
11996	Xylene (Total)	1330-20-7	N.D.	0.2	3.0	1

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

A targeted library search was performed yielding the following results: ethylene oxide and 1-propanol are non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H151241AA	05/05/2015 02:17	Sara E Johnson	1
11997	2-Propanol	SW-846 8260C	1	L151201AA	04/30/2015 19:09	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L151201AA	04/30/2015 19:09	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H151241AA	05/05/2015 02:17	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16-2 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859340
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015 12:00 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C2- SDG#: RAE37-07

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/05/2015 02:38	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/05/2015 02:38	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16-3 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859341
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015 13:00 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C3- SDG#: RAE37-08

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/05/2015 03:00	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/05/2015 03:00	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16-5 Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859342
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015 14:10 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C5- SDG#: RAE37-09

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/05/2015 03:21	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/05/2015 03:21	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: **16WC2B Grab Groundwater**
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859343
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/22/2015 09:15 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16C2B SDG#: RAE37-10

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/05/2015 03:43	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/05/2015 03:43	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: 16SPRING Grab Groundwater
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859344
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015 14:30 by KC

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16CSP SDG#: RAE37-11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/05/2015 04:04	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/05/2015 04:04	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank_1 Water
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859345
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16TB1 SDG#: RAE37-12TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/04/2015 23:04	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/04/2015 23:04	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank_2 Water
2Q 2015 Annual Groundwater Monitoring Ev
RAAP - Radford, VA - HWMU16

LL Sample # WW 7859346
LL Group # 1555749
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 04/21/2015

Submitted: 04/23/2015 09:10
Reported: 05/08/2015 11:36

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

16TB2 SDG#: RAE37-13TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation*	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	0.1	1
11996	2-Butanone	78-93-3	< 10	10	1.0	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	0.1	1
11996	Chloroethane	75-00-3	< 1.0	1.0	0.1	1
11996	Chloromethane	74-87-3	< 1.0	1.0	0.2	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	0.1	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	0.1	1
11996	Dimethyl ether	115-10-6	< 13	13	0.1	1
11996	Ethyl ether	60-29-7	< 13	13	0.1	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	0.1	1
11996	Freon 113	76-13-1	< 1.0	1.0	0.2	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	0.2	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	0.1	1
11996	Toluene	108-88-3	< 1.0	1.0	0.1	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	0.1	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	0.1	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	0.1	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	0.1	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	18 RAAP compounds	SW-846 8260C	1	H151243AA	05/04/2015 23:26	Sara E Johnson	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H151243AA	05/04/2015 23:26	Sara E Johnson	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555749
Reported: 05/08/2015 11:36

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank LOQ**	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H151243AA	Sample number(s): 7859340-7859346								
Benzene	< 1.0	1.0	0.1	ug/l	93		80-120		
2-Butanone	< 10	10.	1.0	ug/l	124		75-128		
Carbon Tetrachloride	< 1.0	1.0	0.1	ug/l	93		80-135		
Chloroethane	< 1.0	1.0	0.1	ug/l	89		68-120		
Chloromethane	< 1.0	1.0	0.2	ug/l	83		55-125		
Dichlorodifluoromethane	< 1.0	1.0	0.1	ug/l	70		35-142		
1,1-Dichloroethane	< 1.0	1.0	0.1	ug/l	92		80-120		
1,1-Dichloroethene	< 1.0	1.0	0.1	ug/l	94		80-120		
Dimethyl ether	< 13	13.	0.1	ug/l	104		80-120		
Ethyl ether	< 13	13.	0.1	ug/l	91		65-132		
Ethylbenzene	< 1.0	1.0	0.1	ug/l	96		80-120		
Freon 113	< 1.0	1.0	0.2	ug/l	93		75-120		
Methylene Chloride	< 1.0	1.0	0.2	ug/l	94		80-120		
Tetrachloroethene	< 1.0	1.0	0.1	ug/l	95		80-120		
Toluene	< 1.0	1.0	0.1	ug/l	97		80-120		
1,1,1-Trichloroethane	< 1.0	1.0	0.1	ug/l	89		80-120		
Trichloroethene	< 1.0	1.0	0.1	ug/l	94		80-120		
Trichlorofluoromethane	< 1.0	1.0	0.1	ug/l	91		64-141		
Xylene (Total)	< 3.0	3.0	0.1	ug/l	96		80-120		

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H151241AA	Sample number(s): 7859332-7859339								
Acetone	5.0 J	3.0	10	ug/l	99		66-132		
Acetonitrile	N.D.	32.	100	ug/l	116		50-145		
Acrolein	N.D.	5.0	25	ug/l	73		44-122		
Acrylonitrile	N.D.	1.0	10	ug/l	99		75-133		
Allyl Chloride	N.D.	0.8	10	ug/l	105		73-124		
Benzene	N.D.	0.1	1.0	ug/l	93		80-120		
Bromodichloromethane	N.D.	0.1	1.0	ug/l	90		80-120		
Bromoform	N.D.	0.1	1.0	ug/l	89		64-134		
Bromomethane	N.D.	0.5	1.0	ug/l	88		62-126		
2-Butanone	N.D.	1.0	10	ug/l	100		75-128		
Carbon Disulfide	N.D.	0.4	10	ug/l	91		70-128		
Carbon Tetrachloride	N.D.	0.2	1.0	ug/l	93		80-135		
2-Chloro-1,3-butadiene	N.D.	0.5	10	ug/l	80		78-120		
Chloroethane	N.D.	0.1	1.0	ug/l	89		68-120		
Chloroform	N.D.	0.1	1.0	ug/l	93		80-120		
Chloromethane	N.D.	0.2	1.0	ug/l	83		55-125		
1,2-Dibromo-3-chloropropane	N.D.	0.2	1.0	ug/l	89		72-136		
Dibromochloromethane	N.D.	0.1	1.0	ug/l	98		80-126		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555749
Reported: 05/08/2015 11:36

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,2-Dibromoethane	N.D.	0.1	1.0	ug/l	100		80-120		
Dibromomethane	N.D.	0.1	1.0	ug/l	94		80-120		
trans-1,4-Dichloro-2-butene	N.D.	1.0	10	ug/l	99		14-166		
1,2-Dichlorobenzene	N.D.	0.1	1.0	ug/l	93		80-120		
1,3-Dichlorobenzene	N.D.	0.1	1.0	ug/l	93		80-120		
1,4-Dichlorobenzene	N.D.	0.1	1.0	ug/l	95		80-120		
Dichlorodifluoromethane	N.D.	0.1	1.0	ug/l	70		35-142		
1,1-Dichloroethane	N.D.	0.1	1.0	ug/l	92		80-120		
1,2-Dichloroethane	N.D.	0.1	1.0	ug/l	92		80-125		
1,1-Dichloroethene	N.D.	0.2	1.0	ug/l	94		80-120		
trans-1,2-Dichloroethene	N.D.	0.2	1.0	ug/l	96		80-120		
1,2-Dichloropropane	N.D.	0.1	1.0	ug/l	93		80-120		
1,3-Dichloropropane	N.D.	0.1	1.0	ug/l	97		80-120		
trans-1,3-Dichloropropene	N.D.	0.1	1.0	ug/l	98		77-126		
Dimethyl ether	N.D.	0.1	13	ug/l	104		80-120		
1,4-Dioxane	N.D.	45.	200	ug/l	108		79-147		
Ethyl ether	N.D.	1.1	13	ug/l	91		65-132		
Ethyl Methacrylate	N.D.	0.8	10	ug/l	93		70-120		
Ethylbenzene	N.D.	0.1	1.0	ug/l	96		80-120		
Freon 113	N.D.	0.2	1.0	ug/l	93		75-120		
Hexachlorobutadiene	N.D.	0.1	1.0	ug/l	85		74-123		
Hexachloroethane	N.D.	0.1	10	ug/l	107		80-120		
2-Hexanone	N.D.	1.0	10	ug/l	104		72-124		
Isobutyl Alcohol	N.D.	10.	200	ug/l	89		79-127		
Methacrylonitrile	N.D.	9.8	100	ug/l	103		77-132		
Methyl Iodide	N.D.	0.6	10	ug/l	91		79-120		
Methyl Methacrylate	N.D.	3.6	10	ug/l	103		74-125		
4-Methyl-2-pentanone	N.D.	1.0	10	ug/l	102		71-123		
Methylene Chloride	N.D.	0.2	1.0	ug/l	94		80-120		
Naphthalene	N.D.	0.1	1.0	ug/l	78		72-120		
Pentachloroethane	N.D.	0.8	10	ug/l	101		80-123		
Propionitrile	N.D.	10.	100	ug/l	94		76-135		
Styrene	N.D.	0.1	1.0	ug/l	97		80-120		
1,1,1,2-Tetrachloroethane	N.D.	0.1	1.0	ug/l	97		80-120		
1,1,2,2-Tetrachloroethane	N.D.	0.2	1.0	ug/l	102		80-120		
Tetrachloroethene	N.D.	0.1	1.0	ug/l	95		80-120		
Tetrahydrofuran	N.D.	2.0	25	ug/l	92		73-127		
Toluene	N.D.	0.1	1.0	ug/l	97		80-120		
1,2,4-Trichlorobenzene	N.D.	0.1	1.0	ug/l	80		80-120		
1,1,1-Trichloroethane	N.D.	0.1	1.0	ug/l	89		80-120		
1,1,2-Trichloroethane	N.D.	0.1	1.0	ug/l	99		80-120		
Trichloroethene	N.D.	0.2	1.0	ug/l	94		80-120		
Trichlorofluoromethane	N.D.	0.2	1.0	ug/l	91		64-141		
1,2,3-Trichloropropane	N.D.	0.3	1.0	ug/l	100		80-120		
Vinyl Acetate	N.D.	3.3	10	ug/l	104		18-200		
Vinyl Chloride	N.D.	0.2	1.0	ug/l	90		59-124		
Xylene (Total)	N.D.	0.2	3.0	ug/l	96		80-120		
Batch number: L151201AA	Sample number(s): 7859332-7859339								
2-Propanol	N.D.	50.	100	ug/l	102		66-128		

Sample Matrix Quality Control

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555749
Reported: 05/08/2015 11:36
Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: H151243AA	Sample number(s): 7859340-7859346 UNSPK: P859335								
Benzene	100	99	87-126	1	30				
2-Butanone	101	117	56-160	15	30				
Carbon Tetrachloride	101	102	81-148	1	30				
Chloroethane	93	96	70-139	3	30				
Chloromethane	88	89	49-135	1	30				
Dichlorodifluoromethane	79	78	28-136	2	30				
1,1-Dichloroethane	95	98	81-126	2	30				
1,1-Dichloroethene	103	105	86-132	1	30				
Dimethyl ether	95	98	70-130	2	30				
Ethyl ether	69	91	57-139	6	30				
Ethylbenzene	101	100	80-140	1	30				
Freon 113	104	102	84-136	2	30				
Methylene Chloride	100	99	77-135	1	30				
Tetrachloroethene	103	101	75-129	2	30				
Toluene	102	100	83-127	1	30				
1,1,1-Trichloroethane	98	98	85-140	0	30				
Trichloroethene	104	103	85-131	1	30				
Trichlorofluoromethane	99	100	73-139	1	30				
Xylene (Total)	101	99	81-137	1	30				
Batch number: H151241AA	Sample number(s): 7859332-7859339 UNSPK: 7859335								
Acetone	91	106	57-163	15	30				
Acetonitrile	126	129	77-129	2	30				
Acrolein	71	86	29-149	19	30				
Acrylonitrile	104	120	56-161	14	30				
Allyl Chloride	108	108	61-120	0	30				
Benzene	100	99	87-126	1	30				
Bromodichloromethane	96	94	82-133	2	30				
Bromoform	89	88	60-138	1	30				
Bromomethane	92	94	66-130	3	30				
2-Butanone	101	117	56-160	15	30				
Carbon Disulfide	101	101	84-141	0	30				
Carbon Tetrachloride	101	102	81-148	1	30				
2-Chloro-1,3-butadiene	88	87	78-128	1	30				
Chloroethane	93	96	70-139	3	30				
Chloroform	100	100	86-136	1	30				
Chloromethane	88	89	49-135	1	30				
1,2-Dibromo-3-chloropropane	90	107	53-163	17	30				
Dibromochloromethane	100	97	79-125	3	30				
1,2-Dibromoethane	99	102	84-127	3	30				
Dibromomethane	96	96	83-126	0	30				
trans-1,4-Dichloro-2-butene	108	125	11-172	15	30				
1,2-Dichlorobenzene	96	96	83-117	0	30				
1,3-Dichlorobenzene	98	98	79-132	0	30				
1,4-Dichlorobenzene	99	100	79-120	1	30				
Dichlorodifluoromethane	79	78	28-136	2	30				
1,1-Dichloroethane	95	98	81-126	2	30				
1,2-Dichloroethane	95	94	82-135	1	30				
1,1-Dichloroethene	105	107	86-132	1	30				
trans-1,2-Dichloroethene	104	102	88-127	2	30				
1,2-Dichloropropane	100	100	91-126	0	30				

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555749
Reported: 05/08/2015 11:36

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
1,3-Dichloropropane	100	96	80-127	3	30				
trans-1,3-Dichloropropene	99	100	71-128	1	30				
Dimethyl ether	95	98	70-130	2	30				
1,4-Dioxane	114	138	61-168	19	30				
Ethyl ether	69	91	57-139	6	30				
Ethyl Methacrylate	93	93	73-134	0	30				
Ethylbenzene	101	100	80-140	1	30				
Freon 113	104	102	84-136	2	30				
Hexachlorobutadiene	91	94	65-128	4	30				
Hexachloroethane	112	117	70-130	5	30				
2-Hexanone	105	123	51-149	16	30				
Isobutyl Alcohol	100	100	65-146	0	30				
Methacrylonitrile	107	123	58-155	14	30				
Methyl Iodide	97	97	71-137	0	30				
Methyl Methacrylate	102	123	48-152	19	30				
4-Methyl-2-pentanone	102	118	69-149	15	30				
Methylene Chloride	100	99	77-135	1	30				
Naphthalene	77	81	56-132	4	30				
Pentachloroethane	102	103	68-145	2	30				
Propionitrile	101	116	63-147	14	30				
Styrene	101	101	71-138	0	30				
1,1,1,2-Tetrachloroethane	100	98	87-126	2	30				
1,1,2,2-Tetrachloroethane	101	101	75-131	0	30				
Tetrachloroethene	103	101	75-129	2	30				
Tetrahydrofuran	104	112	56-154	8	30				
Toluene	102	100	83-127	1	30				
1,2,4-Trichlorobenzene	84	86	77-120	3	30				
1,1,1-Trichloroethane	98	98	85-140	0	30				
1,1,2-Trichloroethane	101	100	85-129	2	30				
Trichloroethene	104	103	85-131	1	30				
Trichlorofluoromethane	99	100	73-139	1	30				
1,2,3-Trichloropropane	98	101	76-120	3	30				
Vinyl Acetate	108	106	27-162	1	30				
Vinyl Chloride	99	97	62-135	1	30				
Xylene (Total)	101	99	81-137	1	30				
Batch number: L151201AA	Sample number(s): 7859332-7859339 UNSPK: 7859335								
2-Propanol	94	92	53-142	2	30				

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C (25 ml)
Batch number: H151241AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7859332	100	102	100	95
7859333	98	101	100	95

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1555749
Reported: 05/08/2015 11:36

Surrogate Quality Control

7859334	99	102	99	95
7859335	100	102	100	95
7859336	98	99	102	99
7859337	99	102	102	100
7859338	100	102	101	95
7859339	100	102	100	96
Blank	100	100	100	97
LCS	98	100	103	100
MS	98	99	102	99
MSD	99	102	102	100
Limits:	77-114	74-113	77-110	78-110

Analysis Name: 18 RAAP compounds
Batch number: H151243AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7859340	99	101	100	96
7859341	100	104	101	96
7859342	100	103	100	95
7859343	99	100	101	96
7859344	99	102	100	95
7859345	101	101	101	97
7859346	100	103	100	96
Blank	100	100	100	97
LCS	98	100	103	100
MS	98	99	102	99
MSD	99	102	102	100
Limits:	77-114	74-113	77-110	78-110

Analysis Name: 2-Propanol
Batch number: L151201AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
7859332	95	89	102	98
7859333	94	102	101	99
7859334	94	99	101	98
7859335	94	98	101	97
7859336	96	88	102	98
7859337	96	100	102	99
7859338	95	101	103	99
7859339	93	100	101	98
Blank	95	101	103	98
LCS	97	101	102	99
MS	96	88	102	98
MSD	96	100	102	99
Limits:	80-116	77-113	80-113	78-113

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

CHAIN OF CUSTODY RECORD

Laboratory: Eurofins Lancaster Laboratories Environmental, 2425 New Holland Pike, Lancaster, PA, 17605-2425/ Barb Weyandt, Manager/ (717) 656-2300 x1576

Client: A-11200 0 **Attn:** 0 **Address:** G-1555749 0 0 **Phone:** S-7854332- 0 **Fax:** 46 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU16 **Event:** 2Q 2015 Annual Groundwater Monitoring Event **DAA JN:** B03204-13 **Lab JN:**	~~Project Specific (PS)~~ or Batch (B) QC: Sample Collection for Project Complete? YES **Carrier:** UPS 12.754.02X.40.4007.4687 **Tracking Number:**

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER _____
Preserved and shipped on ice: YES

Box 4 - Sample Type	G	G							
Box 3 - Filtered/Unfiltered	U	U							
Required pH of Sample	<2	<2							
Box 2 - Preservative	A	A							
Box 5 - Sample Container Type	3-40ml V	3-40ml V							

Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	8260C/5030C 25 ml purge volume	8260C/5030C 2-5 ml purge volume for propanol ONLY						
16C1	4/22	1510	GW	6	X	X						
16MW8		1015	GW	6	X	X						
16MW9		1130	GW	6	X	X						
16WC1A		1345	GW	18	X	X						
16WDUP		1355	GW	6	X	X						
16WC1B	↓	1240	GW	6	X	X						
16-2	4/21	1200	GW	3	X							
16-3	4/21	1300	GW	3	X							
16-5	4/21	1410	GW	3	X							
16WC2B	4/22	0915	GW	3	X							
16SPRING	4/21	1430	GW	3	X							
Trip Blank 1	4/21	—	T	2	X							
Trip Blank 2	4/21	—	T	2	X							
~~Trip Blank 3~~			T	2	X		1142	4/23/15				

GENERAL NOTES:
1. Report results to detection limit, with J flags, for italicized wells.
2. Report results at or greater than QL for non-italicized wells.

* this analyte list revised per July 2014 permit renewal. JLR 4.15.21

USE FOR QC

one trip blnnk required per day

Delete if not required

Clients Special Instructions: level 1 with edd. See attached target analyte list.

Received by lab in Good Condition X Yes ____ No Custody Seal Intact X Yes ____ No Temperature upon arrival 2.7 Received on Ice X Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/21/15	#1 Relinquished by (Signature):	Date: 4/22/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print): Tyler Emery	Date: 4/21/15	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date: 4.23.15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0800	Company Name:	Time:	Company Name: ELLE	Time: 910	

1/4 4/11/2015

A-11200
G-1555749
S-7859332-46

2/4

ANALYTICAL METHOD: 8260C/5030C
TYPE METHOD: GCMS
CLASS: VOLATILE

THIS APPLIES TO WELLS 16-2, 16-3, 16-5, 16WC2B, 16SPRING

1.	Carbon tetrachloride	56-23-5	1
2.	chloromethane ; (Methyl chloride)	74-87-3	1
3.	2-butanone (methyl ethyl ketone - MEK)	78-93-3	10
4.	1,1-dichloroethane	75-34-3	1
5.	Dichlorodifluoromethane	75-71-8	1
6.	Ethylbenzene	100-41-4	1
7.	Tetrachloroethene	127-18-4	1
8.	Toluene (methyl benzene)	108-88-3	1
9.	1,1,1-trichloroethane (methyl chloroform)	71-55-6	1
10.	Trichloroethene	79-01-6	1
11.	Trichlorofluoromethane (CFC-11)	75-69-4	1
12.	Xylenes (total)	1330-20-7	3
13	Chloroethane	75-00-3	1
14	Diethyl ether	60-29-7	12.5
15	Dimethyl ether	115-10-6	12.5
16	Methylene chloride	75-09-2	1
17	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1
18	Benzene	71-43-2	1
19	1,1-Dichloroethene	75-35-4	1

Notes
13-16 added 10/03. JCF
Revised 10/31/03 JCF

17 added 0704. Revised 7/28/2004
10/2008 JCF
18 added 04 2011. JCF
19 added 04 2014. KPO, location 16-1 removed 2014

* report to at or above QL.
JVK
4-10-15

25 ml purge volume

A-11200
G-1555749
S-7859332-46

3/4

NALYTICAL METHOD: 8260C/ GCMS/ Volatile (2 of 2 pages)
THIS APPLIES TO WELLS 16C1, 16MW8, 16MW9,16WC1A, 16WDUP, 16WC1B & QC

ANALYTICAL METHOD: 8260C/ GCMS/ Volatile (1 of 2 pages)
THIS APPLIES TO WELLS 16C1, 16MW8, 16MW9,16WC1A, 16WDUP, 16WC1B & QC

	Analyte	CAS#	SecondaryName	TertiaryName
1.	Acetone	67-64-1		
2.	Acetonitrile	75-05-8		
3.	Acrolein	107-02-8		
4.	Acrylonitrile	107-13-1		
5.	Allyl chloride	107-05-1		
6.	Benzene	71-43-2		
7.	Bromodichloromethane	75-27-4		
8.	Bromoform	75-25-2	Tribromomethane	
9.	Carbon disulfide	75-15-0		
10.	Carbon tetrachloride	56-23-5		
* 11.	Chloroethane	75-00-3	Ethyl chloride	
12.	Chloroform	67-66-3	Trichloromethane	
13.	Chloroprene	126-99-8		
14.	Dibromochloromethane	124-48-1		
15.	1,2-Dibromo-3-chloropropane	96-12-8	DBCP	
16.	1,2-Dibromoethane	106-93-4	EDB	Ethylene dibromide
17.	1,2-Dichlorobenzene	95-50-1	o-Dichlorobenzene	
18.	1,3-Dichlorobenzene	541-73-1	m-Dichlorobenzene	
19.	1,4-Dichlorobenzene	106-46-7	p-Dichlorobenzene	
20.	trans-1,4-Dichloro-2-butene	110-57-6		
21.	Dichlorodifluoromethane	75-71-8		
22.	1,1-Dichloroethane	75-34-3		
23.	1,2-Dichloroethane	107-06-2		
24.	1,1-Dichloroethene	75-35-4		
25.	trans-1,2-Dichloroethene	156-60-5		
26.	1,2-Dichloropropane	78-87-5		
27.	1,3-Dichloropropane	142-28-9		
28.	trans-1,3-Dichloropropene	10061-02-6		
29.	Diethyl ether	60-29-7		
30.	Dimethyl ether	115-10-6		
31.	1,4-Dioxane	123-91-1		
32.	Ethylbenzene	100-41-4		
33.	Ethyl methacrylate	97-63-2		
34.	Hexachlorobutadiene	87-68-3		
35.	Hexachloroethane	67-72-1		
36.	2-Hexanone	591-78-6	Methyl butyl ketone	MBK
37.	Isobutyl alcohol	78-83-1		
38.	Methacrylonitrile	126-98-7		
39.	Bromomethane	74-83-9	Methyl bromide	
* 40.	Chloromethane	74-87-3	Methyl chloride	
41.	2-Butanone	78-93-3	Methyl ethyl ketone	MEK
42.	Iodomethane	74-88-4	methyl iodide	
43.	Methyl methacrylate	80-62-6		
44.	4-Methyl-2-pentanone	108-10-1	Methyl isobutyl	
45.	Dibromomethane	74-95-3	Methylene bromide	

t:\environmental\bbg\databases\raap\sample event set up\jcf\jcf-tal\hwmu16-target analtye list-annual rev 10 - 2014.doc

A-11200
G-1555749
S-785932-46

4/4

NALYTICAL METHOD: 8260C/ GCMS/ Volatile (2 of 2 pages)
THIS APPLIES TO WELLS 16C1, 16MW8, 16MW9,16WC1A, 16WDUP, 16WC1B & QC

46.	Methylene chloride	75-09-2		
47.	Naphthalene	91-20-3		
48.	Pentachloroethane	76-01-7		
49.	2-Propanol	67-63-0	Isopropanol	
50.	Propionitrile	107-12-0		
51.	Styrene	100-42-5		
52.	1,1,1,2-Tetrachloroethane	630-20-6		
53.	1,1,2,2-Tetrachloroethane	79-34-5		
54.	Tetrachloroethene	127-18-4	Tetrachloroethylene	
55.	Tetrahydrofuran	109-99-9		
56.	Toluene	108-88-3		
57.	1,2,4-Trichlorobenzene	120-82-1		
58.	1,1,1-Trichloroethane	71-55-6	Methylchloroform	
59.	1,1,2-Trichloroethane	79-00-5		
60.	Trichloroethene	79-01-6	Trichloroethene	
61.	Trichlorofluoromethane	75-69-4		
62.	1,2,3-Trichloropropane	96-18-4		
63.	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	Freon-13	
64.	Vinyl acetate	108-05-4		
65.	Vinyl chloride	75-01-4		
66.	Xylenes (Total)	1330-20-7		

Rev per July 2014 permit renewal. JCF 4-2015

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Sample Administration Receipt Documentation Log

Doc Log ID: 66695

Group Number(s): 1555749

Client: Draper Aden

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	04/23/2015 9:10
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	VA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Brandy Barclay (2299) at 11:43 on 04/23/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

CompuChem
A Division Of
Liberty Analytical Corp.

4/30/2015

Abridged data package.
Full deliverable available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

WorkOrder: 1504090

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13 **Sdg:** 1504090

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504090-01	16WC1A	Water	04/22/2015 13:45	04/23/2015 14:10
1504090-02	16C1	Water	04/22/2015 15:10	04/23/2015 14:10
1504090-03	16MW8	Water	04/22/2015 10:15	04/23/2015 14:10
1504090-04	16MW9	Water	04/22/2015 11:30	04/23/2015 14:10
1504090-05	16WDUP	Water	04/22/2015 13:55	04/23/2015 14:10
1504090-06	16WC1B	Water	04/22/2015 12:40	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Laboratory: COMPUCHEM

SDG: 1504090

Client Sample Id:	Analysis:	Lab Sample Id:
16WC1A	SW8270D APPIX	1504090-01
16WC1A	SW8270D ADD	1504090-01
16WC1A	SW8270D ADD	1504090-01
16WC1A	SW8270D ADD	1504090-01
16WC1A	SW8270D	1504090-01
16C1	SW8270D	1504090-02
16C1	SW8270D APPIX	1504090-02
16C1	SW8270D ADD	1504090-02
16C1	SW8270D ADD	1504090-02
16C1	SW8270D ADD	1504090-02
16MW8	SW8270D	1504090-03
16MW8	SW8270D APPIX	1504090-03
16MW8	SW8270D ADD	1504090-03
16MW8	SW8270D ADD	1504090-03
16MW8	SW8270D ADD	1504090-03
16MW9	SW8270D	1504090-04
16MW9	SW8270D APPIX	1504090-04
16MW9	SW8270D ADD	1504090-04
16MW9	SW8270D ADD	1504090-04
16MW9	SW8270D ADD	1504090-04
16WDUP	SW8270D ADD	1504090-05
16WDUP	SW8270D ADD	1504090-05
16WDUP	SW8270D ADD	1504090-05
16WDUP	SW8270D	1504090-05
16WDUP	SW8270D APPIX	1504090-05
16WC1B	SW8270D APPIX	1504090-06
16WC1B	SW8270D ADD	1504090-06
16WC1B	SW8270D ADD	1504090-06
16WC1B	SW8270D ADD	1504090-06
16WC1B	SW8270D	1504090-06

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Quentisha Forrester

Name: Quentisha Forrester

Date: 04/30/2015

Title: Chemist III

Environmental Testing Laboratories
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501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem

A division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # 1504090
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 16WC1A 16C1 16MW8 16MW9 16WDUP 16WC1B

The 6 aqueous samples listed above were received intact, refrigerated between -0.4°C and 0.7°C, with proper documentation, in sealed shipping containers, on April 23, 2015. These samples were scheduled for the requested analyses of the semivolatile fraction only. SW-846, 3rd Edition, Update 3, Separatory Funnel extraction (Method 3510C), and Method 8270D were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client.

The additional Semivolatile analyses that the client requested were for Hexachlorphene, p-Phenylenediamine, Kepone, Famphur and APPIX.

Semivolatile

Extraction and analysis holding time requirements were met for these samples.

No Semivolatile project analytes were confirmed above the Quantitation Limit (QL) in any of these samples.

Manual integrations were performed in this SDG, as indicated on the detailed Manual Integration Summary report that is located in section S. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG. At the clients request, 3,3'-Dimethylbenzidine was removed from the calibration standard 5D06001-CAL5 (SSTD050CS). After this change, the recovery of 3,3'-Dimethylbenzidine was biased high in the analysis of SLCSVM, and 3,3'-Dimethylbenzidine was not detected in the duplicate matrix spikes.

All of the surrogates met recovery and retention time criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples.

The associated method blanks met all quality control criteria.

16WC1A was used as the original to prepare the duplicate matrix spikes as requested. The associated duplicate matrix spikes met most of the advisory accuracy and precision criteria. Laboratory Control Samples (LCS/LCSD) were prepared and analyzed along with these samples and met all accuracy and precision criteria with the following exceptions. The recovery of p-Phenylenediamine was biased low in the analysis of SLCSVP/SLCSDVP. The recovery of 1,4-Naphthoquinone was biased low in the analysis of SLCSVM.

An uncertainty of these test results may be estimated from the recovery of the surrogates added to the sample prior to sample preparation or from the recovery of spiked compound(s) in the associated laboratory control sample. Further information is available upon request.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Furthermore, I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Quentisha Forrester
Chemist III
April 30, 2015

GC and GC/MS Column and Trap Specifications Table

COLUMNS

Columns Utilized	Brand Name	Coating Material	ID (mm)	Film Thickness (um)	Length (m)
	GC Laboratory				
DRO/ORO	Restek	RTX-5	0.53	1.0	30
	Restek	RTX-SMS	0.53	1.0	30
√	Restek	clpest	0.32	0.5	30
√	Restek	clpest2	0.32	0.42	30
	J&W	DB-210	0.53	1.0	30
RSK	J&W	GS-GASPRO	0.32	N/A	30
	GC Volatiles Laboratory				
GRO	Restek	RTX-Volatiles	0.53	2.0	30
	GC/MS Volatiles Laboratory				
	Restek	RTX-VMS	0.18	1.0	20
√	Supelco	SPB-624	0.32	1.8	60
	Supelco	SPB-624	0.53	3.0	75
	Phenomonex	ZB-624	0.32	1.8	60
	GC/MS Semivolatiles Laboratory				
√	Restek	RTX-5Sil MS	0.32	0.25	30
	HPLC Laboratory				
PAH	Supelco	Supelcosil LC-PAH	4.6	5.0	15 cm
PAH	Supelco	Discovery RP Amide C16	4.6	5.0	25 cm
EXP	Restek	Pinnacle Cyano	4.6	5.0	25 cm
EXP	Restek	Allure C18	4.6	5.0	25 cm

TRAPS

	GC and GC/MS Volatiles Laboratory	
	Supelco J (BETXTRAP™)	* 7.7 cm Carbopack C
		* 1.2 cm Carbopack B
√	Supelco K (Vocarb3000)	* 10 cm of Carbopack B (Graphitized Carbons)
		* 6 cm of Carboxen 1000 (Carbon molecular sieves)
		* 1 cm of Carboxen 1001 (Carbon molecular sieves)

Rev. 30

This table contains the GC columns (and volatile organic trap) used for the analysis of volatiles, semivolatiles, pesticides, and Aroclors by the requested analytical methods. Please see the SDG Narrative(s) for the specific fraction(s) relative to this SDG.
Note: This table also contains HPLC columns.

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

RUSH 4/16/15

Client: 0 **Attn:** 0 **Address:** 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU16 **Event:** 2Q 2015 Annual Groundwater Monitoring Event **OAA JN:** B03204-13 **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES **Carrier:** DASH COURIER **Tracking Number:**		

Box 1: Matrix	Box 2: Preservative	Box 3: Filtered/Unfiltered	Box 4: Sample Type	Invoice
SW Surface Water GW Groundwater L Leachate S Soil T Trip Blank E Equipment Blank P Product O Other	A HCL B HNO_3 C H_2SO_4 D $Na_2S_2O_3$ E NaOH F ZnAc G Other (Specify) H None	F Filtered U Unfiltered **Box 5: Sample Container Type** P Plastic AG Amber Glass V VOA CG Clear Glass	G Grab C Composite	**Copy to Consultant:** YES **Bill:** CLIENT OTHER **Preserved and shipped on ice:** YES

GENERAL NOTES:

1. Report results to detection limit, with J flags, for italicized wells.
2. Report results at or greater than QL for non-italicized wells. 3. ERIS Deliverable required.
4. VELAP accreditation required.
5. Full deliverable.

Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	ICP/MS 6020A/3005A (Metals-Total)	7470A (Mercury-Total)		8270D/3510C (Semivolatiles)	9012B/9010C(Cyanide)	metals pH	cyanide pH				
Box 4 - Sample Type					G	G		G	G						
Box 3 - Filtered/Unfiltered					U	U		U	U						
Required pH of Sample					<2	<2			>12						
Box 2 - Preservative					B	B		H	E						
Box 5 - Sample Container Type					1-500 ml P			2-1L AG	1-500-P						
16C1	4/22	1510	GW	4	X	X		X	X	<2	>12	1504090	-02		
16MW8		1015	GW	4	X	X		X	X	<2	>12		-03		
16MW9		1130	GW	4	X	X		X	X	<2	>12		-04		
16WC1A		1345	GW	10 12	X	X		X	X	<2	>12		-01	(1) 500mL P container USE FOR QC for ms/msd/matrix spiked	
16WDUP		1355	GW	4	X	X		X	X	<2	>12		-05		
16WC1B		1240	GW	4	X	X		X	X	<2	>12		-06		
16-2	4/21	1200	GW	3	X	X		X		<2		1504091	-01		
16-3	4/21	1300	GW	3	X	X		X		<2			-02		
16-5	4/21	1410	GW	3	X	X		X		<2			-03		
16WC2B	4/22	0915	GW	3	X	X		X		<2			-04		
16SPRING	4/21	1430	GW	3	X	X		X		<2			-05		

Clients Special Instructions: Level 4 with edd. See attached target analyte list. ✓ 0.1°C, 0.7°C, -0.4°C, -0.1°C, 0.2°C, 0.1°C CN 16WC1B in ⑤ cooler @

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival ✓ Received on ice ✓ Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/21/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): TAYLOR	Date: 4/23/15	Sample Storage Time Requested:	
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1037	Company Name: DASH COURIER	Time: 1410		
Sampler Name (Print): Tyler Emery	Date: 4/21/15	#1 Received by (Signature): TAYLOR	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG	
Sampler Signature:	Time: 0800	Company Name: DASH	Time: 10:35	Company Name: CompuChem	Time: 1410		

1/8 JVR 4/17

HOLDING TIME SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
16WC1A	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16C1	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16MW8	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16MW9	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16WDUP	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16WC1B	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.5	40	

HOLDING TIME SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
16WC1A	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16WC1A	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16WC1A	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16C1	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16C1	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16C1	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16MW8	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16MW8	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16MW8	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	

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CompuChem
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HOLDING TIME SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
16MW9	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.3	40	
16MW9	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16MW9	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16WDUP	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.5	40	
16WDUP	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16WDUP	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.5	40	
16WC1B	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.4	40	
16WC1B	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.5	40	
16WC1B	04/22/15	04/23/15	04/28/15	6	7	04/28/15	0.5	40	

HOLDING TIME SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
16WC1A	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.2	40	
16C1	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.3	40	
16MW8	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.3	40	
16MW9	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.3	40	
16WDUP	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.3	40	
16WC1B	04/22/15	04/23/15	04/28/15	6	7	04/29/15	1.4	40	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090 Instrument: 5972hp66

Sequence: 5D28003 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
Blank (5042407-BLK1) ug/L Lab File ID: 5042407-BLK166.d Analyzed: 04/28/15 14:41				
2-Fluorophenol	100.0	68	33 - 110	
Phenol-d5	100.0	41	20 - 110	
Nitrobenzene-d5	50.00	93	45 - 110	
2-Fluorobiphenyl	50.00	85	46 - 110	
2,4,6-Tribromophenol	100.0	88	42 - 119	
Terphenyl-d14	50.00	99	59 - 110	
LCS (5042407-BS1) ug/L Lab File ID: 5042407-BS166.d Analyzed: 04/28/15 15:21				
2-Fluorophenol	100.0	74	33 - 110	
Phenol-d5	100.0	45	20 - 110	
Nitrobenzene-d5	50.00	100	45 - 110	
2-Fluorobiphenyl	50.00	95	46 - 110	
2,4,6-Tribromophenol	100.0	101	42 - 119	
Terphenyl-d14	50.00	100	59 - 110	
16WC1A (1504090-01) ug/L Lab File ID: 1504090-01S66.d Analyzed: 04/28/15 16:00				
2-Fluorophenol	100.0	63	33 - 110	
Phenol-d5	100.0	37	20 - 110	
Nitrobenzene-d5	50.00	90	45 - 110	
2-Fluorobiphenyl	50.00	84	46 - 110	
2,4,6-Tribromophenol	100.0	94	42 - 119	
Terphenyl-d14	50.00	97	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090 Instrument: 5972hp66

Sequence: 5D28003 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
Matrix Spike (5042407-MS1) ug/L Lab File ID: 5042407-MS166.d Analyzed: 04/28/15 16:39				
2-Fluorophenol	100.0	62	33 - 110	
Phenol-d5	100.0	43	20 - 110	
Nitrobenzene-d5	50.00	74	45 - 110	
2-Fluorobiphenyl	50.00	70	46 - 110	
2,4,6-Tribromophenol	100.0	79	42 - 119	
Terphenyl-d14	50.00	75	59 - 110	
Matrix Spike Dup (5042407-MSD1) ug/L Lab File ID: 5042407-MSD166.d Analyzed: 04/28/15 17:19				
2-Fluorophenol	100.0	62	33 - 110	
Phenol-d5	100.0	44	20 - 110	
Nitrobenzene-d5	50.00	69	45 - 110	
2-Fluorobiphenyl	50.00	76	46 - 110	
2,4,6-Tribromophenol	100.0	81	42 - 119	
Terphenyl-d14	50.00	76	59 - 110	
16C1 (1504090-02) ug/L Lab File ID: 1504090-02S66.d Analyzed: 04/28/15 17:58				
2-Fluorophenol	100.0	65	33 - 110	
Phenol-d5	100.0	38	20 - 110	
Nitrobenzene-d5	50.00	95	45 - 110	
2-Fluorobiphenyl	50.00	87	46 - 110	
2,4,6-Tribromophenol	100.0	94	42 - 119	
Terphenyl-d14	50.00	103	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090 Instrument: 5972hp66

Sequence: 5D28003 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
16MW8 (1504090-03) ug/L Lab File ID: 1504090-03S66.d Analyzed: 04/28/15 18:38				
2-Fluorophenol	100.0	56	33 - 110	
Phenol-d5	100.0	32	20 - 110	
Nitrobenzene-d5	50.00	87	45 - 110	
2-Fluorobiphenyl	50.00	79	46 - 110	
2,4,6-Tribromophenol	100.0	90	42 - 119	
Terphenyl-d14	50.00	97	59 - 110	
16MW9 (1504090-04) ug/L Lab File ID: 1504090-04S66.d Analyzed: 04/28/15 19:17				
2-Fluorophenol	100.0	57	33 - 110	
Phenol-d5	100.0	32	20 - 110	
Nitrobenzene-d5	50.00	79	45 - 110	
2-Fluorobiphenyl	50.00	79	46 - 110	
2,4,6-Tribromophenol	100.0	81	42 - 119	
Terphenyl-d14	50.00	96	59 - 110	
16WDUP (1504090-05) ug/L Lab File ID: 1504090-05S66.d Analyzed: 04/28/15 19:56				
2-Fluorophenol	100.0	60	33 - 110	
Phenol-d5	100.0	35	20 - 110	
Nitrobenzene-d5	50.00	84	45 - 110	
2-Fluorobiphenyl	50.00	78	46 - 110	
2,4,6-Tribromophenol	100.0	86	42 - 119	
Terphenyl-d14	50.00	92	59 - 110	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

SDG: 1504090 Instrument: 5972hp66

Sequence: 5D28003 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
16WC1B (1504090-06) ug/L Lab File ID: 1504090-06S66.d Analyzed: 04/28/15 20:36				
2-Fluorophenol	100.0	58	33 - 110	
Phenol-d5	100.0	34	20 - 110	
Nitrobenzene-d5	50.00	82	45 - 110	
2-Fluorobiphenyl	50.00	78	46 - 110	
2,4,6-Tribromophenol	100.0	83	42 - 119	
Terphenyl-d14	50.00	95	59 - 110	

LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-BS1 Matrix: Water Client ID: SLCSVJ Batch: 5042407

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
N-Nitrosodimethylamine	40.00	30.5	76		20 - 100
Pyridine	40.00	25.1	63		20 - 100
Phenol	40.00	18.9	47		21 - 100
Bis(2-chloroethyl)ether	40.00	38.8	97		53 - 102
2-Chlorophenol	40.00	38.8	97		58 - 100
2-Methylphenol	40.00	35.4	89		56 - 100
2,2'-oxybis(1-Chloropropane)	40.00	41.7	104		44 - 115
3 & 4-Methylphenol	40.00	31.8	80		52 - 100
N-Nitroso-di-N-propylamine	40.00	39.4	98		58 - 107
Acetophenone	40.00	37.7	94		39 - 100
Hexachloroethane	40.00	35.3	88		32 - 100
Nitrobenzene	40.00	38.4	96		59 - 100
Isophorone	40.00	39.2	98		60 - 100
2-Nitrophenol	40.00	40.0	100		62 - 110
2,4-Dimethylphenol	40.00	36.7	92		20 - 120
Bis(2-chloroethoxy)methane	40.00	40.0	100		63 - 104
2,4-Dichlorophenol	40.00	38.4	96		62 - 106
4-Chloroaniline	40.00	36.7	92		61 - 100
4-Chloro-3-methylphenol	40.00	39.8	99		66 - 107
2-Methylnaphthalene	40.00	35.7	89		49 - 102
Hexachlorocyclopentadiene	40.00	32.9	82		31 - 100
1,2,4,5-Tetrachlorobenzene	40.00	37.3	93		20 - 150
2,4,6-Trichlorophenol	40.00	43.3	108		62 - 113
2,4,5-Trichlorophenol	40.00	38.8	97		58 - 120
2-Chloronaphthalene	40.00	39.3	98		56 - 103
2-Nitroaniline	40.00	41.5	104		67 - 110
Dimethylphthalate	40.00	37.3	93		64 - 109

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LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-BS1 Matrix: Water Client ID: SLCSVJ Batch: 5042407

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
2,6-Dinitrotoluene	40.00	38.5	96		66 - 117
Acenaphthylene	40.00	38.7	97		65 - 110
3-Nitroaniline	40.00	36.9	92		68 - 113
Acenaphthene	40.00	40.4	101		61 - 106
2,4-Dinitrophenol	40.00	43.9	110		37 - 140
4-Nitrophenol	40.00	18.0	45		20 - 100
2,4-Dinitrotoluene	40.00	36.5	91		58 - 123
Dibenzofuran	40.00	38.6	96		64 - 107
2,3,4,6-Tetrachlorophenol	40.00	37.7	94		20 - 150
Diethylphthalate	40.00	37.4	94		64 - 114
4-Chlorophenyl-phenylether	40.00	37.7	94		63 - 109
Fluorene	40.00	38.8	97		64 - 110
4-Nitroaniline	40.00	38.2	96		78 - 124
4,6-Dinitro-2-methylphenol	40.00	44.3	111		65 - 131
N-Nitrosodiphenylamine (1)	40.00	40.1	100		67 - 107
4-Bromophenyl-phenylether	40.00	41.4	104		65 - 112
Hexachlorobenzene	40.00	39.9	100		58 - 118
Pentachlorophenol	40.00	46.1	115		53 - 150
Phenanthrene	40.00	40.4	101		72 - 107
Anthracene	40.00	40.9	102		70 - 107
Di-n-butylphthalate	40.00	40.0	100		65 - 109
Fluoranthene	40.00	39.4	98		67 - 113
Pyrene	40.00	39.7	99		73 - 111
Butylbenzylphthalate	40.00	41.5	104		73 - 116
3,3'-Dichlorobenzidine	40.00	37.8	94		41 - 111
bis(2-ethylhexyl)Phthalate	40.00	43.5	109		75 - 114
Benzo (a) anthracene	40.00	40.7	102		71 - 112

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-BS1 Matrix: Water Client ID: SLCSVJ Batch: 5042407

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Chrysene	40.00	42.7	107		75 - 112
Di-n-octylphthalate	40.00	38.1	95		68 - 123
Benzo (b) fluoranthene	40.00	41.7	104		70 - 118
Benzo(k)fluoranthene	40.00	39.8	99		65 - 116
Benzo (a) pyrene	40.00	40.7	102		70 - 109
Indeno(1,2,3-cd)pyrene	40.00	40.6	102		71 - 119
Dibenzo(a,h)anthracene	40.00	38.4	96		57 - 121
Benzo (g,h,i) perylene	40.00	41.3	103		66 - 117
1,3-Dinitrobenzene	40.00	32.4	81		20 - 150
Aniline	40.00	36.3	91		20 - 150
Benzyl alcohol	40.00	36.5	91		29 - 100

LCS / LCS DUPLICATE SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-BS1 Matrix: Water Client ID: SLCSVM Batch: 5042414

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
2-Picoline	40.00	28.1	70		20 - 150
N-Nitrosomethylethylamine	40.00	29.2	73		20 - 150
Methyl Methanesulfonate	40.00	28.5	71		20 - 150
N-Nitrosodiethylamine	40.00	33.4	84		20 - 150
Ethyl Methanesulfonate	40.00	33.7	84		20 - 150
N-Nitrosopyrrolidine	40.00	36.6	91		20 - 150
N-Nitrosomorpholine	40.00	34.6	87		20 - 150
o-Toluidine	40.00	33.8	84		20 - 150
N-Nitrosopiperidine	40.00	31.8	80		20 - 150
o,o,o-Triethyl phosphorothioate	40.00	35.2	88		20 - 150
2,6-Dichlorophenol	40.00	34.0	85		20 - 150
Hexachloropropene	40.00	20.0	50		20 - 150
N-Nitroso-di-n-butylamine	40.00	34.3	86		20 - 150
Safrole	40.00	34.1	85		20 - 150
Isosafrole	40.00	33.8	85		20 - 150
1,4-Naphthoquinone	**40.00**	**3.72 J**	**9**	*	**20 - 150**
Pentachlorobenzene	40.00	35.7	89		20 - 150
1-Naphthylamine	40.00	22.0	55		20 - 150
2-Naphthylamine	40.00	25.6	64		20 - 150
Zinophos	40.00	36.4	91		20 - 150
5-Nitro-o-toluidine	40.00	35.9	90		20 - 150
Sulfotep	40.00	41.2	103		20 - 150
1,3,5-Trinitrobenzene	40.00	36.9	92		20 - 150
Phorate	40.00	38.4	96		20 - 150
Phenacetin	40.00	38.3	96		20 - 150
Dimethoate	40.00	40.8	102		20 - 150
4-Aminobiphenyl	40.00	27.3	68		20 - 150

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LCS / LCS DUPLICATE SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-BS1 Matrix: Water Client ID: SLCSVM Batch: 5042414

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Pentachloronitrobenzene	40.00	39.9	100		20 - 150
Pronamide	40.00	39.6	99		20 - 150
Disulfoton	40.00	34.9	87		20 - 150
Methyl Parathion	40.00	42.1	105		20 - 150
Parathion	40.00	45.4	114		20 - 150
4-Nitroquinoline-1-oxide	40.00	37.6	94		20 - 150
Methapyrilene	40.00	26.9	67		20 - 150
Isodrin	40.00	40.2	101		20 - 150
p-Dimethylaminoazobenzene	40.00	44.0	110		20 - 150
Chlorobenzilate	40.00	42.6	107		20 - 150
3,3'-Dimethylbenzidine	**40.00**	**81.1 E**	**203**	*	**20 - 150**
2-Acetylaminofluorene	40.00	42.7	107		20 - 150
7,12-Dimethylbenz(a)anthracene	40.00	40.2	101		20 - 150
3-Methylcholanthrene	40.00	37.2	93		20 - 150
Diallate	40.00	40.0	100		20 - 150
a,a-Dimethylphenethylamine	40.00	8.09 J	20		20 - 150
Aramite	40.00	41.4	104		20 - 150

LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042415-BS1 Matrix: Water Client ID: SLCSVN Batch: 5042415

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Hexachlorophene	1000	879	88		20 - 150

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LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042415-BSD1 Matrix: Water Client ID: SLCSDVN Batch: 5042415

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Hexachlorophene	1000	777	78	12	30		20 - 150

LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042416-BS1 Matrix: Water Client ID: SLCSVO Batch: 5042416

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Famphur	40.00	36.0	90		20 - 150
Kepone	40.00	38.8	97		20 - 150

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LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042416-BSD1 Matrix: Water Client ID: SLCSDVO Batch: 5042416

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
Famphur	40.00	36.9	92	2	30		20 - 150
Kepone	40.00	41.0	103	6	30		20 - 150

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LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042417-BS1 Matrix: Water Client ID: SLCSVP Batch: 5042417

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
p-Phenylenediamine	**1000**	**62.2**	**6**	*	**20 - 150**

LCS / LCS DUPLICATE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042417-BSD1 Matrix: Water Client ID: SLCSDVP Batch: 5042417

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #		% RPD #	QC LIMITS RPD	Q	REC.
p-Phenylenediamine	**1000**	**67.0**	**7**	*	7	**30**	*	**20 - 150**

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
N-Nitrosodimethylamine	40.00	5.0 U	25.9	65		20 - 100
Pyridine	40.00	5.0 U	22.1	55		20 - 100
Phenol	40.00	10 U	19.0	47		21 - 100
Bis(2-chloroethyl)ether	40.00	5.0 U	28.5	71		53 - 102
2-Chlorophenol	40.00	10 U	27.3	68		58 - 100
2-Methylphenol	40.00	10 U	27.6	69		56 - 100
2,2'-oxybis(1-Chloropropane)	40.00	5.0 U	29.5	74		44 - 115
3 & 4-Methylphenol	40.00	10 U	25.3	63		52 - 100
N-Nitroso-di-N-propylamine	40.00	5.0 U	28.6	72		58 - 107
Acetophenone	40.00	5.0 U	28.8	72		39 - 100
Hexachloroethane	40.00	5.0 U	24.8	62		32 - 100
Nitrobenzene	40.00	5.0 U	28.8	72		59 - 100
Isophorone	40.00	5.0 U	29.5	74		60 - 100
2-Nitrophenol	40.00	10 U	30.0	75		62 - 110
2,4-Dimethylphenol	40.00	10 U	30.3	76		20 - 120
Bis(2-chloroethoxy)methane	40.00	5.0 U	30.6	77		63 - 104
2,4-Dichlorophenol	40.00	10 U	29.1	73		62 - 106
4-Chloroaniline	40.00	10 U	27.6	69		61 - 100
4-Chloro-3-methylphenol	40.00	10 U	30.8	77		66 - 107
2-Methylnaphthalene	40.00	5.0 U	27.5	69		49 - 102
Hexachlorocyclopentadiene	40.00	5.0 U	23.6	59		31 - 100
1,2,4,5-Tetrachlorobenzene	40.00	5.0 U	27.8	70		20 - 150
2,4,6-Trichlorophenol	40.00	10 U	32.8	82		62 - 113
2,4,5-Trichlorophenol	40.00	10 U	29.3	73		58 - 120
2-Chloronaphthalene	40.00	5.0 U	30.0	75		56 - 103
2-Nitroaniline	40.00	10 U	32.0	80		67 - 110
Dimethylphthalate	40.00	5.0 U	29.6	74		64 - 109
2,6-Dinitrotoluene	40.00	5.0 U	29.5	74		66 - 117
Acenaphthylene	40.00	5.0 U	30.7	77		65 - 110
3-Nitroaniline	40.00	10 U	29.4	74		68 - 113

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Acenaphthene	40.00	5.0 U	31.1	78		61 - 106
2,4-Dinitrophenol	40.00	10 U	33.8	84		37 - 140
4-Nitrophenol	40.00	10 U	18.6	47		20 - 100
2,4-Dinitrotoluene	40.00	5.0 U	28.6	71		58 - 123
Dibenzofuran	40.00	5.0 U	30.0	75		64 - 107
2,3,4,6-Tetrachlorophenol	40.00	10 U	29.0	72		20 - 150
Diethylphthalate	40.00	5.0 U	29.7	74		64 - 114
4-Chlorophenyl-phenylether	40.00	5.0 U	30.2	76		63 - 109
Fluorene	40.00	5.0 U	30.8	77		64 - 110
4-Nitroaniline	40.00	10 U	29.6	74	*	78 - 124
4,6-Dinitro-2-methylphenol	40.00	10 U	34.1	85		65 - 131
N-Nitrosodiphenylamine (1)	40.00	5.0 U	32.3	81		67 - 107
4-Bromophenyl-phenylether	40.00	5.0 U	32.0	80		65 - 112
Hexachlorobenzene	40.00	5.0 U	31.8	80		58 - 118
Pentachlorophenol	40.00	10 U	35.8	90		53 - 150
Phenanthrene	40.00	5.0 U	30.9	77		72 - 107
Anthracene	40.00	5.0 U	32.1	80		70 - 107
Di-n-butylphthalate	40.00	5.0 U	30.7	77		65 - 109
Fluoranthene	40.00	5.0 U	30.2	75		67 - 113
Pyrene	40.00	5.0 U	30.4	76		73 - 111
Butylbenzylphthalate	40.00	5.0 U	30.7	77		73 - 116
3,3'-Dichlorobenzidine	40.00	5.0 U	29.3	73		41 - 111
bis(2-ethylhexyl)Phthalate	40.00	5.0 U	33.5	84		75 - 114
Benzo (a) anthracene	40.00	5.0 U	30.8	77		71 - 112
Chrysene	40.00	5.0 U	32.9	82		75 - 112
Di-n-octylphthalate	40.00	5.0 U	29.5	74		68 - 123
Benzo (b) fluoranthene	40.00	5.0 U	30.5	76		70 - 118
Benzo(k)fluoranthene	40.00	5.0 U	32.7	82		65 - 116
Benzo (a) pyrene	40.00	5.0 U	31.1	78		70 - 109
Indeno(1,2,3-cd)pyrene	40.00	5.0 U	29.7	74		71 - 119

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Dibenzo(a,h)anthracene	40.00	5.0 U	28.3	71		57 - 121
Benzo (g,h,i) perylene	40.00	5.0 U	31.7	79		66 - 117
1,3-Dinitrobenzene	40.00	5.0 U	27.7	69		20 - 150
Aniline	40.00	5.0 U	26.7	67		20 - 150
Benzyl alcohol	40.00	5.0 U	28.3	71		29 - 100

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
N-Nitrosodimethylamine	40.00	25.8	64	0.7		30	20 - 100
Pyridine	40.00	23.2	58	5		30	20 - 100
Phenol	40.00	18.5	46	3		30	21 - 100
Bis(2-chloroethyl)ether	40.00	28.5	71	0.2		30	53 - 102
2-Chlorophenol	40.00	27.9	70	2		30	58 - 100
2-Methylphenol	40.00	27.5	69	0.3		30	56 - 100
2,2'-oxybis(1-Chloropropane)	40.00	28.7	72	3		30	44 - 115
3 & 4-Methylphenol	40.00	25.8	64	2		30	52 - 100
N-Nitroso-di-N-propylamine	40.00	29.1	73	2		30	58 - 107
Acetophenone	40.00	27.2	68	6		30	39 - 100
Hexachloroethane	40.00	24.4	61	1		30	32 - 100
Nitrobenzene	40.00	28.2	71	2		30	59 - 100
Isophorone	40.00	30.0	75	2		30	60 - 100
2-Nitrophenol	40.00	28.9	72	4		30	62 - 110
2,4-Dimethylphenol	40.00	28.7	72	5		30	20 - 120
Bis(2-chloroethoxy)methane	40.00	30.5	76	0.4		30	63 - 104
2,4-Dichlorophenol	40.00	28.6	72	2		30	62 - 106
4-Chloroaniline	40.00	26.6	67	3		30	61 - 100
4-Chloro-3-methylphenol	40.00	29.8	75	3		30	66 - 107
2-Methylnaphthalene	40.00	25.8	65	6		30	49 - 102
Hexachlorocyclopentadiene	40.00	25.8	64	9		30	31 - 100
1,2,4,5-Tetrachlorobenzene	40.00	30.1	75	8		30	20 - 150
2,4,6-Trichlorophenol	40.00	35.8	89	9		30	62 - 113
2,4,5-Trichlorophenol	40.00	32.0	80	9		30	58 - 120
2-Chloronaphthalene	40.00	31.9	80	6		30	56 - 103
2-Nitroaniline	40.00	34.4	86	7		30	67 - 110
Dimethylphthalate	40.00	29.7	74	0.3		30	64 - 109
2,6-Dinitrotoluene	40.00	30.7	77	4		30	66 - 117
Acenaphthylene	40.00	31.0	78	1		30	65 - 110
3-Nitroaniline	40.00	28.5	71	3		30	68 - 113
Acenaphthene	40.00	31.2	78	0.3		30	61 - 106

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
2,4-Dinitrophenol	40.00	34.5	86	2		30	37 - 140
4-Nitrophenol	40.00	19.9	50	7		30	20 - 100
2,4-Dinitrotoluene	40.00	28.3	71	0.9		30	58 - 123
Dibenzofuran	40.00	30.5	76	2		30	64 - 107
2,3,4,6-Tetrachlorophenol	40.00	28.2	71	3		30	20 - 150
Diethylphthalate	40.00	30.7	77	3		30	64 - 114
4-Chlorophenyl-phenylether	40.00	30.8	77	2		30	63 - 109
Fluorene	40.00	31.0	78	0.6		30	64 - 110
4-Nitroaniline	40.00	31.3	78	6		30	78 - 124
4,6-Dinitro-2-methylphenol	40.00	34.1	85	0.2		30	65 - 131
N-Nitrosodiphenylamine (1)	40.00	31.9	80	1		30	67 - 107
4-Bromophenyl-phenylether	40.00	33.4	83	4		30	65 - 112
Hexachlorobenzene	40.00	32.1	80	0.7		30	58 - 118
Pentachlorophenol	40.00	34.5	86	4		30	53 - 150
Phenanthrene	40.00	31.5	79	2		30	72 - 107
Anthracene	40.00	32.8	82	2		30	70 - 107
Di-n-butylphthalate	40.00	31.7	79	3		30	65 - 109
Fluoranthene	40.00	30.9	77	2		30	67 - 113
Pyrene	40.00	31.0	77	2		30	73 - 111
Butylbenzylphthalate	40.00	31.8	79	3		30	73 - 116
3,3'-Dichlorobenzidine	40.00	28.9	72	1		30	41 - 111
bis(2-ethylhexyl)Phthalate	40.00	33.5	84	0.09		30	75 - 114
Benzo (a) anthracene	40.00	31.6	79	2		30	71 - 112
Chrysene	40.00	32.9	82	0.1		30	75 - 112
Di-n-octylphthalate	40.00	30.6	76	4		30	68 - 123
Benzo (b) fluoranthene	40.00	31.4	79	3		30	70 - 118
Benzo(k)fluoranthene	40.00	35.8	89	9		30	65 - 116
Benzo (a) pyrene	40.00	31.8	80	2		30	70 - 109
Indeno(1,2,3-cd)pyrene	40.00	32.8	82	10		30	71 - 119
Dibenzo(a,h)anthracene	40.00	28.6	72	1		30	57 - 121
Benzo (g,h,i) perylene	40.00	33.4	84	5		30	66 - 117

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042407-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
1,3-Dinitrobenzene	40.00	26.5	66	4		30	20 - 150
Aniline	40.00	26.2	66	2		30	20 - 150
Benzyl alcohol	40.00	26.4	66	7		30	29 - 100

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D APPIX

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
2-Picoline	40.00	5.0 U	32.0	80		20 - 150
N-Nitrosomethylethylamine	40.00	5.0 U	32.1	80		20 - 150
Methyl Methanesulfonate	40.00	5.0 U	31.2	78		20 - 150
N-Nitrosodiethylamine	40.00	5.0 U	32.0	80		20 - 150
Ethyl Methanesulfonate	40.00	5.0 U	33.0	83		20 - 150
N-Nitrosopyrrolidine	40.00	5.0 U	37.7	94		20 - 150
N-Nitrosomorpholine	40.00	5.0 U	36.3	91		20 - 150
o-Toluidine	40.00	5.0 U	30.8	77		20 - 150
N-Nitrosopiperidine	40.00	5.0 U	33.2	83		20 - 150
o,o,o-Triethyl phosphorothioate	40.00	5.0 U	34.4	86		20 - 150
2,6-Dichlorophenol	40.00	10 U	35.7	89		20 - 150
Hexachloropropene	40.00	5.0 U	18.9	47		20 - 150
N-Nitroso-di-n-butylamine	40.00	5.0 U	35.9	90		20 - 150
Safrole	40.00	5.0 U	36.5	91		20 - 150
Isosafrole	40.00	5.0 U	35.2	88		20 - 150
1,4-Naphthoquinone	40.00	5.0 U	4.03	10	*	20 - 150
Pentachlorobenzene	40.00	5.0 U	36.2	91		20 - 150
1-Naphthylamine	40.00	5.0 U	8.07	20		20 - 150
2-Naphthylamine	40.00	5.0 U	20.7	52		20 - 150
Zinophos	40.00	5.0 U	37.9	95		20 - 150
5-Nitro-o-toluidine	40.00	5.0 U	37.2	93		20 - 150
Sulfotep	40.00	5.0 U	44.4	111		20 - 150
1,3,5-Trinitrobenzene	40.00	5.0 U	37.3	93		20 - 150
Phorate	40.00	5.0 U	39.1	98		20 - 150
Phenacetin	40.00	5.0 U	34.2	85		20 - 150
Dimethoate	40.00	5.0 U	38.7	97		20 - 150
4-Aminobiphenyl	40.00	5.0 U	22.0	55		20 - 150
Pentachloronitrobenzene	40.00	5.0 U	38.1	95		20 - 150
Pronamide	40.00	5.0 U	40.2	100		20 - 150
Disulfoton	40.00	5.0 U	27.1	68		20 - 150

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D APPIX

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-MS1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Methyl Parathion	40.00	5.0 U	41.1	103		20 - 150
Parathion	40.00	5.0 U	41.6	104		20 - 150
4-Nitroquinoline-1-oxide	40.00	5.0 U	35.4	88		20 - 150
Methapyrilene	40.00	5.0 U	25.0	63		20 - 150
Isodrin	40.00	5.0 U	37.3	93		20 - 150
p-Dimethylaminoazobenzene	40.00	5.0 U	35.2	88		20 - 150
Chlorobenzilate	40.00	5.0 U	39.1	98		20 - 150
3,3'-Dimethylbenzidine	40.00	5.0 U	5.0 U	0	*	20 - 150
2-Acetylaminofluorene	40.00	5.0 U	35.6	89		20 - 150
7,12-Dimethylbenz(a)anthracene	40.00	5.0 U	36.8	92		20 - 150
3-Methylcholanthrene	40.00	5.0 U	34.3	86		20 - 150
Diallate	40.00	10 U	38.4	96		20 - 150
a,a-Dimethylphenethylamine	40.00	15 U	5.28	13	*	20 - 150
Aramite	40.00	5.0 U	36.4	91		20 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D APPIX

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
2-Picoline	40.00	30.3	76	5		30	20 - 150
N-Nitrosomethylethylamine	40.00	32.0	80	0.5		30	20 - 150
Methyl Methanesulfonate	40.00	30.2	75	3		30	20 - 150
N-Nitrosodiethylamine	40.00	31.7	79	1		30	20 - 150
Ethyl Methanesulfonate	40.00	32.9	82	0.3		30	20 - 150
N-Nitrosopyrrolidine	40.00	36.5	91	3		30	20 - 150
N-Nitrosomorpholine	40.00	36.6	92	0.9		30	20 - 150
o-Toluidine	40.00	30.8	77	0.05		30	20 - 150
N-Nitrosopiperidine	40.00	35.5	89	7		30	20 - 150
o,o,o-Triethyl phosphorothioate	40.00	35.0	88	2		30	20 - 150
2,6-Dichlorophenol	40.00	36.7	92	3		30	20 - 150
Hexachloropropene	40.00	18.4	46	3		30	20 - 150
N-Nitroso-di-n-butylamine	40.00	35.3	88	2		30	20 - 150
Safrole	40.00	36.5	91	0.1		30	20 - 150
Isosafrole	40.00	32.7	82	7		30	20 - 150
1,4-Naphthoquinone	40.00	4.03	10	0.04	*	30	20 - 150
Pentachlorobenzene	40.00	38.2	95	5		30	20 - 150
1-Naphthylamine	40.00	5.33	13	41	* *	30	20 - 150
2-Naphthylamine	40.00	19.1	48	8		30	20 - 150
Zinophos	40.00	40.5	101	7		30	20 - 150
5-Nitro-o-toluidine	40.00	38.0	95	2		30	20 - 150
Sulfotep	40.00	44.2	111	0.4		30	20 - 150
1,3,5-Trinitrobenzene	40.00	35.1	88	6		30	20 - 150
Phorate	40.00	37.0	92	6		30	20 - 150
Phenacetin	40.00	35.8	89	5		30	20 - 150
Dimethoate	40.00	39.1	98	1		30	20 - 150
4-Aminobiphenyl	40.00	21.1	53	4		30	20 - 150
Pentachloronitrobenzene	40.00	38.7	97	2		30	20 - 150
Pronamide	40.00	38.8	97	4		30	20 - 150
Disulfoton	40.00	29.3	73	8		30	20 - 150
Methyl Parathion	40.00	39.0	98	5		30	20 - 150

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D APPIX

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042414-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1504090-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Parathion	40.00	40.8	102	2		30	20 - 150
4-Nitroquinoline-1-oxide	40.00	31.2	78	13		30	20 - 150
Methapyrilene	40.00	19.1	48	27		30	20 - 150
Isodrin	40.00	35.6	89	5		30	20 - 150
p-Dimethylaminoazobenzene	40.00	34.5	86	2		30	20 - 150
Chlorobenzilate	40.00	36.9	92	6		30	20 - 150
3,3'-Dimethylbenzidine	40.00	5.0 U	0		*	30	20 - 150
2-Acetylaminofluorene	40.00	33.8	84	5		30	20 - 150
7,12-Dimethylbenz(a)anthracene	40.00	35.5	89	4		30	20 - 150
3-Methylcholanthrene	40.00	34.5	86	0.7		30	20 - 150
Diallate	40.00	36.3	91	6		30	20 - 150
a,a-Dimethylphenethylamine	40.00	15 U	0		*	30	20 - 150
Aramite	40.00	35.6	89	2		30	20 - 150

PREPARATION BATCH SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042407 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1504090-01	04/28/15 09:24	1000	1000
16C1	1504090-02	04/28/15 09:24	1000	1000
16MW8	1504090-03	04/28/15 09:24	1000	1000
16MW9	1504090-04	04/28/15 09:24	1000	1000
16WDUP	1504090-05	04/28/15 09:24	1000	1000
16WC1B	1504090-06	04/28/15 09:24	1000	1000
SBLKVJ	5042407-BLK1	04/28/15 09:24	1000	1000
SLCSVJ	5042407-BS1	04/28/15 09:24	1000	1000
16WC1AMS	5042407-MS1	04/28/15 09:24	500	500
16WC1AMSD	5042407-MSD1	04/28/15 09:24	500	500

PREPARATION BATCH SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042414 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1504090-01	04/28/15 09:24	1000	1000
16C1	1504090-02	04/28/15 09:24	1000	1000
16MW8	1504090-03	04/28/15 09:24	1000	1000
16MW9	1504090-04	04/28/15 09:24	1000	1000
16WDUP	1504090-05	04/28/15 09:24	1000	1000
16WC1B	1504090-06	04/28/15 09:24	1000	1000
SBLKVM	5042414-BLK1	04/28/15 09:24	1000	1000
SLCSVM	5042414-BS1	04/28/15 09:24	1000	1000
16WC1AMS	5042414-MS1	04/28/15 09:24	500	500
16WC1AMSD	5042414-MSD1	04/28/15 09:24	500	500

PREPARATION BATCH SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042415 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1504090-01	04/28/15 09:24	1000	1000
16C1	1504090-02	04/28/15 09:24	1000	1000
16MW8	1504090-03	04/28/15 09:24	1000	1000
16MW9	1504090-04	04/28/15 09:24	1000	1000
16WDUP	1504090-05	04/28/15 09:24	1000	1000
16WC1B	1504090-06	04/28/15 09:24	1000	1000
SBLKVN	5042415-BLK1	04/28/15 09:24	1000	1000
SLCSVN	5042415-BS1	04/28/15 09:24	1000	1000
SLCSDVN	5042415-BSD1	04/28/15 09:24	1000	1000

PREPARATION BATCH SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042416 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1504090-01	04/28/15 09:24	1000	1000
16C1	1504090-02	04/28/15 09:24	1000	1000
16MW8	1504090-03	04/28/15 09:24	1000	1000
16MW9	1504090-04	04/28/15 09:24	1000	1000
16WDUP	1504090-05	04/28/15 09:24	1000	1000
16WC1B	1504090-06	04/28/15 09:24	1000	1000
SBLKVO	5042416-BLK1	04/28/15 09:24	1000	1000
SLCSVO	5042416-BS1	04/28/15 09:24	1000	1000
SLCSDVO	5042416-BSD1	04/28/15 09:24	1000	1000

PREPARATION BATCH SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Batch: 5042417 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1504090-01	04/28/15 09:24	1000	1000
16C1	1504090-02	04/28/15 09:24	1000	1000
16MW8	1504090-03	04/28/15 09:24	1000	1000
16MW9	1504090-04	04/28/15 09:24	1000	1000
16WDUP	1504090-05	04/28/15 09:24	1000	1000
16WC1B	1504090-06	04/28/15 09:24	1000	1000
SBLKVP	5042417-BLK1	04/28/15 09:24	1000	1000
SLCSVP	5042417-BS1	04/28/15 09:24	1000	1000
SLCSDVP	5042417-BSD1	04/28/15 09:24	1000	1000

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D06001 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCS	5D06001-TUN1	5D06001-TUN166.d	04/06/15 12:01:00
SSTD060CS	5D06001-CAL6	5D06001-CAL666.d	04/06/15 12:22:00
SSTD050CS	5D06001-CAL5	5D06001-CAL566.d	04/06/15 13:02:00
SSTD040CS	5D06001-CAL4	5D06001-CAL466.d	04/06/15 13:41:00
SSTD025CS	5D06001-CAL3	5D06001-CAL366.d	04/06/15 14:21:00
SSTD010CS	5D06001-CAL2	5D06001-CAL266.d	04/06/15 15:00:00
SSTD005CS	5D06001-CAL1	5D06001-CAL166.d	04/06/15 15:39:00
SCV025VAL1CS	5D06001-SCV1	5D06001-SCV166.d	04/06/15 16:20:00

ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27003 Calibration: 5042807 Instrument: 5972hp62

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPBZ	5D27003-TUN1	5D27003-TUN162.d	04/27/15 11:36:00
SSTD350BZ	5D27003-CAL6	5D27003-CAL662.d	04/27/15 13:43:00
SSTD300BZ	5D27003-CAL5	5D27003-CAL562.d	04/27/15 14:22:00
SSTD250BZ	5D27003-CAL4	5D27003-CAL462.d	04/27/15 15:02:00
SSTD200BZ	5D27003-CAL3	5D27003-CAL362.d	04/27/15 15:42:00
SSTD150BZ	5D27003-CAL2	5D27003-CAL262.d	04/27/15 16:21:00
SSTD100BZ	5D27003-CAL1	5D27003-CAL162.d	04/27/15 17:01:00
SCV250BZ	5D27003-SCV1	5D27003-SCV162.d	04/27/15 17:40:00

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ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27005 Calibration: 5042804 Instrument: 5972hp70

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPDF	5D27005-TUN1	5D27005-TUN170.d	04/27/15 11:20:00
SSTD060DF	5D27005-CAL6	5D27005-CAL670.d	04/27/15 11:46:00
SSTD050DF	5D27005-CAL5	5D27005-CAL570.d	04/27/15 12:28:00
SSTD040DF	5D27005-CAL4	5D27005-CAL470.d	04/27/15 13:10:00
SSTD025DF	5D27005-CAL3	5D27005-CAL370.d	04/27/15 13:51:00
SSTD010DF	5D27005-CAL2	5D27005-CAL270.d	04/27/15 14:33:00
SSTD005DF	5D27005-CAL1	5D27005-CAL170.d	04/27/15 15:14:00
SCV025VAL1DF	5D27005-SCV1	5D27005-SCV170.d	04/27/15 16:01:00

ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27014 Calibration: 5042806 Instrument: 5972hp70

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPDG	5D27014-TUN1	5D27014-TUN170.d	04/27/15 16:38:00
SSTD080DG	5D27014-CAL6	5D27014-CAL670.d	04/27/15 17:03:00
SSTD060DG	5D27014-CAL5	5D27014-CAL570.d	04/27/15 17:46:00
SSTD040DG	5D27014-CAL4	5D27014-CAL470.d	04/27/15 18:28:00
SSTD025DG	5D27014-CAL3	5D27014-CAL370.d	04/27/15 19:10:00
SSTD010DG	5D27014-CAL2	5D27014-CAL270.d	04/27/15 19:51:00
SSTD005DG	5D27014-CAL1	5D27014-CAL170.d	04/27/15 20:32:00
SSTD025VAL1DG	5D27014-SCV1	5D27014-SCV170.d	04/27/15 21:14:00

ANALYSIS SEQUENCE SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28001 Calibration: 5042901 Instrument: 5972hp60

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPAX	5D28001-TUN1	5D28001-TUN160.d	04/28/15 11:26:00
SSTD060AX	5D28001-CAL6	5D28001-CAL660.d	04/28/15 11:49:00
SSTD050AX	5D28001-CAL5	5D28001-CAL560.d	04/28/15 12:32:00
SSTD040AX	5D28001-CAL4	5D28001-CAL460.d	04/28/15 13:13:00
SSTD025AX	5D28001-CAL3	5D28001-CAL360.d	04/28/15 13:56:00
SSTD010AX	5D28001-CAL2	5D28001-CAL260.d	04/28/15 14:38:00
SSTD005AX	5D28001-CAL1	5D28001-CAL160.d	04/28/15 15:20:00
SCV025VAL1AX	5D28001-SCV1	5D28001-SCV160.d	04/28/15 16:44:00

ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28002 Calibration: 5042807 Instrument: 5972hp62

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPBA	5D28002-TUN1	5D28002-TUN162.d	04/28/15 12:40:00
SSTD250BA	5D28002-ICV1	5D28002-ICV162.d	04/28/15 13:01:00
SBLKVN	5042415-BLK1	5042415-BLK162.d	04/28/15 13:46:00
SLCSVN	5042415-BS1	5042415-BS162.d	04/28/15 14:26:00
SLCSDVN	5042415-BSD1	5042415-BSD162.d	04/28/15 15:06:00
16WC1A	1504090-01	1504090-01H62.d	04/28/15 15:45:00
16C1	1504090-02	1504090-02H62.d	04/28/15 16:25:00
16MW8	1504090-03	1504090-03H62.d	04/28/15 17:04:00
16MW9	1504090-04	1504090-04H62.d	04/28/15 17:44:00
16WDUP	1504090-05	1504090-05H62.d	04/28/15 18:24:00
16WC1B	1504090-06	1504090-06H62.d	04/28/15 19:03:00

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCZ	5D28003-TUN1	5D28003-TUN1R66.d	04/28/15 13:00:00
SSTD025CZ	5D28003-ICV1	5D28003-ICV1R66.d	04/28/15 14:02:00
SBLKVJ	5042407-BLK1	5042407-BLK166.d	04/28/15 14:41:00
SLCSVJ	5042407-BS1	5042407-BS166.d	04/28/15 15:21:00
16WC1A	1504090-01	1504090-01S66.d	04/28/15 16:00:00
16WC1AMS	5042407-MS1	5042407-MS166.d	04/28/15 16:39:00
16WC1AMSD	5042407-MSD1	5042407-MSD166.d	04/28/15 17:19:00
16C1	1504090-02	1504090-02S66.d	04/28/15 17:58:00
16MW8	1504090-03	1504090-03S66.d	04/28/15 18:38:00
16MW9	1504090-04	1504090-04S66.d	04/28/15 19:17:00
16WDUP	1504090-05	1504090-05S66.d	04/28/15 19:56:00
16WC1B	1504090-06	1504090-06S66.d	04/28/15 20:36:00

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ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28004 Calibration: 5042804 Instrument: 5972hp70

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPDI	5D28004-TUN1	5D28004-TUN170.d	04/28/15 12:24:00
SSTD025BI	5D28004-ICV1	5D28004-ICV170.d	04/28/15 12:48:00
SBLKVO	5042416-BLK1	5042416-BLK170.d	04/28/15 14:11:00
SLCSVO	5042416-BS1	5042416-BS170.d	04/28/15 14:53:00
SLCSDVO	5042416-BSD1	5042416-BSD170.d	04/28/15 15:34:00
16WC1A	1504090-01	1504090-01K70.d	04/28/15 17:39:00
16C1	1504090-02	1504090-02K70.d	04/28/15 18:21:00
16MW8	1504090-03	1504090-03K70.d	04/28/15 19:04:00
16MW9	1504090-04	1504090-04K70.d	04/28/15 19:46:00
16WDUP	1504090-05	1504090-05K70.d	04/28/15 20:27:00
16WC1B	1504090-06	1504090-06K70.d	04/28/15 21:09:00

ANALYSIS SEQUENCE SUMMARY

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPDJ	5D28005-TUN1	5D28005-TUN170.d	04/28/15 12:24:00
SSTD025DJ	5D28005-ICV1	5D28005-ICV170.d	04/28/15 13:30:00
SBLKVP	5042417-BLK1	5042417-BLK170.d	04/28/15 14:11:00
SLCSVP	5042417-BS1	5042417-BS170.d	04/28/15 16:16:00
SLCSDVP	5042417-BSD1	5042417-BSD170.d	04/28/15 16:57:00
16WC1A	1504090-01	1504090-01P70.d	04/28/15 17:39:00
16C1	1504090-02	1504090-02P70.d	04/28/15 18:21:00
16MW8	1504090-03	1504090-03P70.d	04/28/15 19:04:00
16MW9	1504090-04	1504090-04P70.d	04/28/15 19:46:00
16WDUP	1504090-05	1504090-05P70.d	04/28/15 20:27:00
16WC1B	1504090-06	1504090-06P70.d	04/28/15 21:09:00

ANALYSIS SEQUENCE SUMMARY

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPAY	5D29001-TUN1	5D29001-TUN160.d	04/29/15 10:02:00
SSTD025AY	5D29001-ICV1	5D29001-ICV160.d	04/29/15 10:25:00
SBLKVM	5042414-BLK1	5042414-BLK160.d	04/29/15 11:14:00
SLCSVM	5042414-BS1	5042414-BS1J60.d	04/29/15 12:37:00
16WC1A	1504090-01	1504090-01A60.d	04/29/15 13:19:00
16WC1AMS	5042414-MS1	5042414-MS160.d	04/29/15 14:01:00
16WC1AMSD	5042414-MSD1	5042414-MSD160.d	04/29/15 14:43:00
16C1	1504090-02	1504090-02A60.d	04/29/15 15:25:00
16MW8	1504090-03	1504090-03A60.d	04/29/15 16:07:00
16MW9	1504090-04	1504090-04A60.d	04/29/15 16:49:00
16WDUP	1504090-05	1504090-05A60.d	04/29/15 17:31:00
16WC1B	1504090-06	1504090-06A60.d	04/29/15 18:13:00

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D06001-TUN166.d	Injection Date:	04/06/15
Instrument ID:	5972hp66	Injection Time:	12:01
Sequence:	5D06001	Lab Sample ID:	5D06001-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	47.2	PASS
68	Less than 2% of 69	0	PASS
69	Present	60.5	PASS
70	Less than 2% of 69	0.0249	PASS
127	10 - 80% of 198	46.3	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.41	PASS
275	10 - 60% of 198	20.1	PASS
365	Greater than 1% of 198	2.59	PASS
441	Less than 100% of 443	79.4	PASS
442	50 - 100% of 198	68.3	PASS
443	15 - 24% of 442	19.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D27003-TUN162.d	Injection Date:	04/27/15
Instrument ID:	5972hp62	Injection Time:	11:36
Sequence:	5D27003	Lab Sample ID:	5D27003-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	48.9	PASS
68	Less than 2% of 69	0.134	PASS
69	Present	62.6	PASS
70	Less than 2% of 69	0.503	PASS
127	10 - 80% of 198	52.1	PASS
197	Less than 2% of 198	0.094	PASS
199	5 - 9% of 198	6.62	PASS
275	10 - 60% of 198	19.7	PASS
365	Greater than 1% of 198	2.39	PASS
441	Less than 100% of 443	79.1	PASS
442	50 - 100% of 198	61.2	PASS
443	15 - 24% of 442	18.7	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D27005-TUN170.d	Injection Date:	04/27/15
Instrument ID:	5972hp70	Injection Time:	11:20
Sequence:	5D27005	Lab Sample ID:	5D27005-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	40	PASS
68	Less than 2% of 69	0	PASS
69	Present	55.6	PASS
70	Less than 2% of 69	0	PASS
127	10 - 80% of 198	52.3	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.71	PASS
275	10 - 60% of 198	21.3	PASS
365	Greater than 1% of 198	2.4	PASS
441	Less than 100% of 443	95.5	PASS
442	50 - 100% of 198	65.8	PASS
443	15 - 24% of 442	19.2	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D27014-TUN170.d	Injection Date:	04/27/15
Instrument ID:	5972hp70	Injection Time:	16:38
Sequence:	5D27014	Lab Sample ID:	5D27014-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	45	PASS
68	Less than 2% of 69	0	PASS
69	Present	62.2	PASS
70	Less than 2% of 69	0	PASS
127	10 - 80% of 198	55.6	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.91	PASS
275	10 - 60% of 198	21.6	PASS
365	Greater than 1% of 198	2.49	PASS
441	Less than 100% of 443	95.7	PASS
442	50 - 100% of 198	60.8	PASS
443	15 - 24% of 442	18.9	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D APPIX

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D28001-TUN160.d	Injection Date:	04/28/15
Instrument ID:	5972hp60	Injection Time:	11:26
Sequence:	5D28001	Lab Sample ID:	5D28001-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	61.3	PASS
68	Less than 2% of 69	0	PASS
69	Present	81.6	PASS
70	Less than 2% of 69	0.269	PASS
127	10 - 80% of 198	53.8	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.69	PASS
275	10 - 60% of 198	21.4	PASS
365	Greater than 1% of 198	2.33	PASS
441	Less than 100% of 443	85.8	PASS
442	50 - 100% of 198	68.4	PASS
443	15 - 24% of 442	19.7	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D28002-TUN162.d	Injection Date:	04/28/15
Instrument ID:	5972hp62	Injection Time:	12:40
Sequence:	5D28002	Lab Sample ID:	5D28002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	54.4	PASS
68	Less than 2% of 69	0	PASS
69	Present	67.9	PASS
70	Less than 2% of 69	0.385	PASS
127	10 - 80% of 198	56.2	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.82	PASS
275	10 - 60% of 198	18.8	PASS
365	Greater than 1% of 198	2.32	PASS
441	Less than 100% of 443	76.5	PASS
442	50 - 100% of 198	51.9	PASS
443	15 - 24% of 442	19.8	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D28003-TUN1R66.d	Injection Date:	04/28/15
Instrument ID:	5972hp66	Injection Time:	13:00
Sequence:	5D28003	Lab Sample ID:	5D28003-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	49.3	PASS
68	Less than 2% of 69	0	PASS
69	Present	61.8	PASS
70	Less than 2% of 69	0	PASS
127	10 - 80% of 198	47.1	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.82	PASS
275	10 - 60% of 198	21	PASS
365	Greater than 1% of 198	2.82	PASS
441	Less than 100% of 443	76.2	PASS
442	50 - 100% of 198	73.6	PASS
443	15 - 24% of 442	19.9	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D28004-TUN170.d	Injection Date:	04/28/15
Instrument ID:	5972hp70	Injection Time:	12:24
Sequence:	5D28004	Lab Sample ID:	5D28004-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	44.3	PASS
68	Less than 2% of 69	0	PASS
69	Present	61.3	PASS
70	Less than 2% of 69	0.0327	PASS
127	10 - 80% of 198	55	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.89	PASS
275	10 - 60% of 198	20.5	PASS
365	Greater than 1% of 198	2.41	PASS
441	Less than 100% of 443	92.6	PASS
442	50 - 100% of 198	61.1	PASS
443	15 - 24% of 442	19.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D28005-TUN170.d	Injection Date:	04/28/15
Instrument ID:	5972hp70	Injection Time:	12:24
Sequence:	5D28005	Lab Sample ID:	5D28005-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	44.3	PASS
68	Less than 2% of 69	0	PASS
69	Present	61.3	PASS
70	Less than 2% of 69	0.0327	PASS
127	10 - 80% of 198	55	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.89	PASS
275	10 - 60% of 198	20.5	PASS
365	Greater than 1% of 198	2.41	PASS
441	Less than 100% of 443	92.6	PASS
442	50 - 100% of 198	61.1	PASS
443	15 - 24% of 442	19.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D APPIX

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D29001-TUN160.d	Injection Date:	04/29/15
Instrument ID:	5972hp60	Injection Time:	10:02
Sequence:	5D29001	Lab Sample ID:	5D29001-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	58.3	PASS
68	Less than 2% of 69	0	PASS
69	Present	79	PASS
70	Less than 2% of 69	0.397	PASS
127	10 - 80% of 198	51.5	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	7.31	PASS
275	10 - 60% of 198	21.4	PASS
365	Greater than 1% of 198	2.94	PASS
441	Less than 100% of 443	86.4	PASS
442	50 - 100% of 198	76.6	PASS
443	15 - 24% of 442	19.4	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D06001	Instrument:	5972hp66
		Calibration:	5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D06001-SCV1)			Lab File ID: 5D06001-SCV166.d		Analyzed: 04/06/15 16:20				
1,4-Dichlorobenzene-d4	148982	7.786	143668	7.788	104	50 - 200	-0.0020	+/-0.50	
Naphthalene-d8	535830	10.617	541824	10.619	99	50 - 200	-0.0020	+/-0.50	
Acenaphthene-d10	306223	14.675	329077	14.677	93	50 - 200	-0.0020	+/-0.50	
Phenanthrene-d10	555068	17.516	592711	17.518	94	50 - 200	-0.0020	+/-0.50	
Chrysene-d12	654684	21.87	707222	21.872	93	50 - 200	-0.0020	+/-0.50	
Perylene-d12	464008	23.965	500476	23.957	93	50 - 200	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D27003	Instrument:	5972hp62
		Calibration:	5042807

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D27003-SCV1)			Lab File ID: 5D27003-SCV162.d			Analyzed: 04/27/15 17:40			
Chrysene-d12	1079330	21.387	1557631	21.396	69	50 - 200	-0.0090	+/-0.50	
Perylene-d12	759398	23.444	1114929	23.444	68	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D27005	Instrument:	5972hp70
		Calibration:	5042804

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D27005-SCV1)			Lab File ID: 5D27005-SCV170.d		Analyzed: 04/27/15 16:01				
Chrysene-d12	732972	21.632	828893	21.631	88	50 - 200	0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D27014	Instrument:	5972hp70
		Calibration:	5042806

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D27014-SCV1)			Lab File ID: 5D27014-SCV170.d		Analyzed: 04/27/15 21:14				
Acenaphthene-d10	420507	14.345	452892	14.356	93	50 - 200	-0.0110	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D APPIX

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D28001	Instrument:	5972hp60
		Calibration:	5042901

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D28001-SCV1)			Lab File ID: 5D28001-SCV160.d		Analyzed: 04/28/15 16:44				
1,4-Dichlorobenzene-d4	88831	6.97	128272	6.965	69	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	311756	9.773	493474	9.768	63	50 - 200	0.0050	+/-0.50	
Acenaphthene-d10	162587	13.794	289542	13.788	56	50 - 200	0.0060	+/-0.50	
Phenanthrene-d10	313510	16.761	540625	16.755	58	50 - 200	0.0060	+/-0.50	
Chrysene-d12	359865	21.088	616289	21.093	58	50 - 200	-0.0050	+/-0.50	
Perylene-d12	252349	23.155	456002	23.149	55	50 - 200	0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D28002
Instrument: 5972hp62
Calibration: 5042807

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D28002-ICV1)			Lab File ID: 5D28002-ICV162.d			Analyzed: 04/28/15 13:01			
Chrysene-d12	815061	21.387	1557631	21.396	52	50 - 200	-0.0090	+/-0.50	
Perylene-d12	594108	23.434	1114929	23.444	53	50 - 200	-0.0100	+/-0.50	
Blank (5042415-BLK1)			Lab File ID: 5042415-BLK162.d			Analyzed: 04/28/15 13:46			
Chrysene-d12	1559488	21.381	815061	21.387	191	50 - 200	-0.0060	+/-0.50	
Perylene-d12	1015451	23.439	594108	23.434	171	50 - 200	0.0050	+/-0.50	
LCS (5042415-BS1)			Lab File ID: 5042415-BS162.d			Analyzed: 04/28/15 14:26			
Chrysene-d12	1497073	21.386	815061	21.387	184	50 - 200	-0.0010	+/-0.50	
Perylene-d12	1061286	23.444	594108	23.434	179	50 - 200	0.0100	+/-0.50	
LCS Dup (5042415-BSD1)			Lab File ID: 5042415-BSD162.d			Analyzed: 04/28/15 15:06			
Chrysene-d12	997124	21.386	815061	21.387	122	50 - 200	-0.0010	+/-0.50	
Perylene-d12	697516	23.444	594108	23.434	117	50 - 200	0.0100	+/-0.50	
16WC1A (1504090-01)			Lab File ID: 1504090-01H62.d			Analyzed: 04/28/15 15:45			
Chrysene-d12	1071121	21.386	815061	21.387	131	50 - 200	-0.0010	+/-0.50	
Perylene-d12	680069	23.433	594108	23.434	114	50 - 200	-0.0010	+/-0.50	
16C1 (1504090-02)			Lab File ID: 1504090-02H62.d			Analyzed: 04/28/15 16:25			
Chrysene-d12	1215441	21.39	815061	21.387	149	50 - 200	0.0030	+/-0.50	
Perylene-d12	826844	23.438	594108	23.434	139	50 - 200	0.0040	+/-0.50	
16MW8 (1504090-03)			Lab File ID: 1504090-03H62.d			Analyzed: 04/28/15 17:04			
Chrysene-d12	1185227	21.381	815061	21.387	145	50 - 200	-0.0060	+/-0.50	
Perylene-d12	764741	23.439	594108	23.434	129	50 - 200	0.0050	+/-0.50	
16MW9 (1504090-04)			Lab File ID: 1504090-04H62.d			Analyzed: 04/28/15 17:44			
Chrysene-d12	1404706	21.391	815061	21.387	172	50 - 200	0.0040	+/-0.50	
Perylene-d12	966762	23.438	594108	23.434	163	50 - 200	0.0040	+/-0.50	
16WDUP (1504090-05)			Lab File ID: 1504090-05H62.d			Analyzed: 04/28/15 18:24			
Chrysene-d12	1219725	21.382	815061	21.387	150	50 - 200	-0.0050	+/-0.50	
Perylene-d12	803703	23.439	594108	23.434	135	50 - 200	0.0050	+/-0.50	
16WC1B (1504090-06)			Lab File ID: 1504090-06H62.d			Analyzed: 04/28/15 19:03			
Chrysene-d12	1380508	21.386	815061	21.387	169	50 - 200	-0.0010	+/-0.50	
Perylene-d12	937146	23.434	594108	23.434	158	50 - 200	0.0000	+/-0.50	

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INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D28003
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D28003-ICV1)			Lab File ID: 5D28003-ICV1R66.d			Analyzed: 04/28/15 14:02			
1,4-Dichlorobenzene-d4	123368	7.703	143668	7.788	86	50 - 200	-0.0850	+/-0.50	
Naphthalene-d8	433042	10.534	541824	10.619	80	50 - 200	-0.0850	+/-0.50	
Acenaphthene-d10	245461	14.592	329077	14.677	75	50 - 200	-0.0850	+/-0.50	
Phenanthrene-d10	418174	17.443	592711	17.518	71	50 - 200	-0.0750	+/-0.50	
Chrysene-d12	520923	21.787	707222	21.872	74	50 - 200	-0.0850	+/-0.50	
Perylene-d12	348816	23.882	500476	23.957	70	50 - 200	-0.0750	+/-0.50	
Blank (5042407-BLK1)			Lab File ID: 5042407-BLK166.d			Analyzed: 04/28/15 14:41			
1,4-Dichlorobenzene-d4	170159	7.698	123368	7.703	138	50 - 200	-0.0050	+/-0.50	
Naphthalene-d8	605037	10.529	433042	10.534	140	50 - 200	-0.0050	+/-0.50	
Acenaphthene-d10	344775	14.586	245461	14.592	140	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	612438	17.438	418174	17.443	146	50 - 200	-0.0050	+/-0.50	
Chrysene-d12	676706	21.792	520923	21.787	130	50 - 200	0.0050	+/-0.50	
Perylene-d12	454177	23.877	348816	23.882	130	50 - 200	-0.0050	+/-0.50	
LCS (5042407-BS1)			Lab File ID: 5042407-BS166.d			Analyzed: 04/28/15 15:21			
1,4-Dichlorobenzene-d4	161495	7.708	123368	7.703	131	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	600281	10.539	433042	10.534	139	50 - 200	0.0050	+/-0.50	
Acenaphthene-d10	335620	14.597	245461	14.592	137	50 - 200	0.0050	+/-0.50	
Phenanthrene-d10	566467	17.448	418174	17.443	135	50 - 200	0.0050	+/-0.50	
Chrysene-d12	671579	21.792	520923	21.787	129	50 - 200	0.0050	+/-0.50	
Perylene-d12	486971	23.877	348816	23.882	140	50 - 200	-0.0050	+/-0.50	
16WC1A (1504090-01)			Lab File ID: 1504090-01S66.d			Analyzed: 04/28/15 16:00			
1,4-Dichlorobenzene-d4	161449	7.698	123368	7.703	131	50 - 200	-0.0050	+/-0.50	
Naphthalene-d8	614316	10.529	433042	10.534	142	50 - 200	-0.0050	+/-0.50	
Acenaphthene-d10	349691	14.597	245461	14.592	142	50 - 200	0.0050	+/-0.50	
Phenanthrene-d10	644339	17.438	418174	17.443	154	50 - 200	-0.0050	+/-0.50	
Chrysene-d12	717255	21.792	520923	21.787	138	50 - 200	0.0050	+/-0.50	
Perylene-d12	488791	23.877	348816	23.882	140	50 - 200	-0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D28003
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (5042407-MS1)			Lab File ID: 5042407-MS166.d			Analyzed: 04/28/15 16:39			
1,4-Dichlorobenzene-d4	159073	7.702	123368	7.703	129	50 - 200	-0.0010	+/-0.50	
Naphthalene-d8	564804	10.533	433042	10.534	130	50 - 200	-0.0010	+/-0.50	
Acenaphthene-d10	320175	14.601	245461	14.592	130	50 - 200	0.0090	+/-0.50	
Phenanthrene-d10	545871	17.442	418174	17.443	131	50 - 200	-0.0010	+/-0.50	
Chrysene-d12	652790	21.796	520923	21.787	125	50 - 200	0.0090	+/-0.50	
Perylene-d12	469431	23.881	348816	23.882	135	50 - 200	-0.0010	+/-0.50	
Matrix Spike Dup (5042407-MSD1)			Lab File ID: 5042407-MSD166.d			Analyzed: 04/28/15 17:19			
1,4-Dichlorobenzene-d4	152282	7.71	123368	7.703	123	50 - 200	0.0070	+/-0.50	
Naphthalene-d8	554108	10.541	433042	10.534	128	50 - 200	0.0070	+/-0.50	
Acenaphthene-d10	279562	14.599	245461	14.592	114	50 - 200	0.0070	+/-0.50	
Phenanthrene-d10	497127	17.45	418174	17.443	119	50 - 200	0.0070	+/-0.50	
Chrysene-d12	596287	21.794	520923	21.787	114	50 - 200	0.0070	+/-0.50	
Perylene-d12	422255	23.879	348816	23.882	121	50 - 200	-0.0030	+/-0.50	
16C1 (1504090-02)			Lab File ID: 1504090-02S66.d			Analyzed: 04/28/15 17:58			
1,4-Dichlorobenzene-d4	145461	7.701	123368	7.703	118	50 - 200	-0.0020	+/-0.50	
Naphthalene-d8	537309	10.533	433042	10.534	124	50 - 200	-0.0010	+/-0.50	
Acenaphthene-d10	319694	14.59	245461	14.592	130	50 - 200	-0.0020	+/-0.50	
Phenanthrene-d10	547064	17.442	418174	17.443	131	50 - 200	-0.0010	+/-0.50	
Chrysene-d12	600531	21.786	520923	21.787	115	50 - 200	-0.0010	+/-0.50	
Perylene-d12	413824	23.881	348816	23.882	119	50 - 200	-0.0010	+/-0.50	
16MW8 (1504090-03)			Lab File ID: 1504090-03S66.d			Analyzed: 04/28/15 18:38			
1,4-Dichlorobenzene-d4	159652	7.708	123368	7.703	129	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	565516	10.539	433042	10.534	131	50 - 200	0.0050	+/-0.50	
Acenaphthene-d10	336214	14.597	245461	14.592	137	50 - 200	0.0050	+/-0.50	
Phenanthrene-d10	581867	17.438	418174	17.443	139	50 - 200	-0.0050	+/-0.50	
Chrysene-d12	666236	21.792	520923	21.787	128	50 - 200	0.0050	+/-0.50	
Perylene-d12	454888	23.877	348816	23.882	130	50 - 200	-0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D28003
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
16MW9 (1504090-04)			Lab File ID: 1504090-04S66.d			Analyzed: 04/28/15 19:17			
1,4-Dichlorobenzene-d4	117232	7.708	123368	7.703	95	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	432569	10.528	433042	10.534	100	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	237116	14.596	245461	14.592	97	50 - 200	0.0040	+/-0.50	
Phenanthrene-d10	396897	17.448	418174	17.443	95	50 - 200	0.0050	+/-0.50	
Chrysene-d12	455749	21.792	520923	21.787	87	50 - 200	0.0050	+/-0.50	
Perylene-d12	304856	23.877	348816	23.882	87	50 - 200	-0.0050	+/-0.50	
16WDUP (1504090-05)			Lab File ID: 1504090-05S66.d			Analyzed: 04/28/15 19:56			
1,4-Dichlorobenzene-d4	158205	7.703	123368	7.703	128	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	591564	10.534	433042	10.534	137	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	343097	14.592	245461	14.592	140	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	581018	17.443	418174	17.443	139	50 - 200	0.0000	+/-0.50	
Chrysene-d12	680852	21.787	520923	21.787	131	50 - 200	0.0000	+/-0.50	
Perylene-d12	460135	23.882	348816	23.882	132	50 - 200	0.0000	+/-0.50	
16WC1B (1504090-06)			Lab File ID: 1504090-06S66.d			Analyzed: 04/28/15 20:36			
1,4-Dichlorobenzene-d4	133906	7.698	123368	7.703	109	50 - 200	-0.0050	+/-0.50	
Naphthalene-d8	507288	10.529	433042	10.534	117	50 - 200	-0.0050	+/-0.50	
Acenaphthene-d10	293913	14.597	245461	14.592	120	50 - 200	0.0050	+/-0.50	
Phenanthrene-d10	498312	17.438	418174	17.443	119	50 - 200	-0.0050	+/-0.50	
Chrysene-d12	544993	21.792	520923	21.787	105	50 - 200	0.0050	+/-0.50	
Perylene-d12	359764	23.877	348816	23.882	103	50 - 200	-0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory:	COMPUCHEM	SDG:	1504090
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence:	5D28004	Instrument:	5972hp70
		Calibration:	5042804

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D28004-ICV1)			Lab File ID: 5D28004-ICV170.d			Analyzed: 04/28/15 12:48			
Chrysene-d12	648661	21.621	828893	21.631	78	50 - 200	-0.0100	+/-0.50	
Blank (5042416-BLK1)			Lab File ID: 5042416-BLK170.d			Analyzed: 04/28/15 14:11			
Chrysene-d12	849112	21.62	648661	21.621	131	50 - 200	-0.0010	+/-0.50	
LCS (5042416-BS1)			Lab File ID: 5042416-BS170.d			Analyzed: 04/28/15 14:53			
Chrysene-d12	911936	21.631	648661	21.621	141	50 - 200	0.0100	+/-0.50	
LCS Dup (5042416-BSD1)			Lab File ID: 5042416-BSD170.d			Analyzed: 04/28/15 15:34			
Chrysene-d12	956084	21.622	648661	21.621	147	50 - 200	0.0010	+/-0.50	
16WC1A (1504090-01)			Lab File ID: 1504090-01K70.d			Analyzed: 04/28/15 17:39			
Chrysene-d12	622099	21.623	648661	21.621	96	50 - 200	0.0020	+/-0.50	
16C1 (1504090-02)			Lab File ID: 1504090-02K70.d			Analyzed: 04/28/15 18:21			
Chrysene-d12	688353	21.627	648661	21.621	106	50 - 200	0.0060	+/-0.50	
16MW8 (1504090-03)			Lab File ID: 1504090-03K70.d			Analyzed: 04/28/15 19:04			
Chrysene-d12	818809	21.631	648661	21.621	126	50 - 200	0.0100	+/-0.50	
16MW9 (1504090-04)			Lab File ID: 1504090-04K70.d			Analyzed: 04/28/15 19:46			
Chrysene-d12	663475	21.631	648661	21.621	102	50 - 200	0.0100	+/-0.50	
16WDUP (1504090-05)			Lab File ID: 1504090-05K70.d			Analyzed: 04/28/15 20:27			
Chrysene-d12	749437	21.627	648661	21.621	116	50 - 200	0.0060	+/-0.50	
16WC1B (1504090-06)			Lab File ID: 1504090-06K70.d			Analyzed: 04/28/15 21:09			
Chrysene-d12	649959	21.626	648661	21.621	100	50 - 200	0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D ADD

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D28005
Instrument: 5972hp70
Calibration: 5042806

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D28005-ICV1)			Lab File ID: 5D28005-ICV170.d			Analyzed: 04/28/15 13:30			
Acenaphthene-d10	410518	14.341	452892	14.356	91	50 - 200	-0.0150	+/-0.50	
Blank (5042417-BLK1)			Lab File ID: 5042417-BLK170.d			Analyzed: 04/28/15 14:11			
Acenaphthene-d10	541392	14.345	410518	14.341	132	50 - 200	0.0040	+/-0.50	
LCS (5042417-BS1)			Lab File ID: 5042417-BS170.d			Analyzed: 04/28/15 16:16			
Acenaphthene-d10	376765	14.346	410518	14.341	92	50 - 200	0.0050	+/-0.50	
LCS Dup (5042417-BSD1)			Lab File ID: 5042417-BSD170.d			Analyzed: 04/28/15 16:57			
Acenaphthene-d10	389422	14.346	410518	14.341	95	50 - 200	0.0050	+/-0.50	
16WC1A (1504090-01)			Lab File ID: 1504090-01P70.d			Analyzed: 04/28/15 17:39			
Acenaphthene-d10	371256	14.348	410518	14.341	90	50 - 200	0.0070	+/-0.50	
16C1 (1504090-02)			Lab File ID: 1504090-02P70.d			Analyzed: 04/28/15 18:21			
Acenaphthene-d10	383363	14.351	410518	14.341	93	50 - 200	0.0100	+/-0.50	
16MW8 (1504090-03)			Lab File ID: 1504090-03P70.d			Analyzed: 04/28/15 19:04			
Acenaphthene-d10	501590	14.345	410518	14.341	122	50 - 200	0.0040	+/-0.50	
16MW9 (1504090-04)			Lab File ID: 1504090-04P70.d			Analyzed: 04/28/15 19:46			
Acenaphthene-d10	411537	14.345	410518	14.341	100	50 - 200	0.0040	+/-0.50	
16WDUP (1504090-05)			Lab File ID: 1504090-05P70.d			Analyzed: 04/28/15 20:27			
Acenaphthene-d10	509292	14.351	410518	14.341	124	50 - 200	0.0100	+/-0.50	
16WC1B (1504090-06)			Lab File ID: 1504090-06P70.d			Analyzed: 04/28/15 21:09			
Acenaphthene-d10	410066	14.351	410518	14.341	100	50 - 200	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D APPIX

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D29001
Instrument: 5972hp60
Calibration: 5042901

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D29001-ICV1)			Lab File ID: 5D29001-ICV160.d			Analyzed: 04/29/15 10:25			
1,4-Dichlorobenzene-d4	111518	6.974	128272	6.965	87	50 - 200	0.0090	+/-0.50	
Naphthalene-d8	474377	9.778	493474	9.768	96	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	275063	13.798	289542	13.788	95	50 - 200	0.0100	+/-0.50	
Phenanthrene-d10	494768	16.755	540625	16.755	92	50 - 200	0.0000	+/-0.50	
Chrysene-d12	529948	21.093	616289	21.093	86	50 - 200	0.0000	+/-0.50	
Perylene-d12	366072	23.149	456002	23.149	80	50 - 200	0.0000	+/-0.50	
Blank (5042414-BLK1)			Lab File ID: 5042414-BLK160.d			Analyzed: 04/29/15 11:14			
1,4-Dichlorobenzene-d4	152894	6.97	111518	6.974	137	50 - 200	-0.0040	+/-0.50	
Naphthalene-d8	570221	9.773	474377	9.778	120	50 - 200	-0.0050	+/-0.50	
Acenaphthene-d10	297965	13.794	275063	13.798	108	50 - 200	-0.0040	+/-0.50	
Phenanthrene-d10	492229	16.761	494768	16.755	99	50 - 200	0.0060	+/-0.50	
Chrysene-d12	539920	21.088	529948	21.093	102	50 - 200	-0.0050	+/-0.50	
Perylene-d12	349818	23.155	366072	23.149	96	50 - 200	0.0060	+/-0.50	
LCS (5042414-BS1)			Lab File ID: 5042414-BS1J60.d			Analyzed: 04/29/15 12:37			
1,4-Dichlorobenzene-d4	130727	6.976	111518	6.974	117	50 - 200	0.0020	+/-0.50	
Naphthalene-d8	522613	9.779	474377	9.778	110	50 - 200	0.0010	+/-0.50	
Acenaphthene-d10	295162	13.8	275063	13.798	107	50 - 200	0.0020	+/-0.50	
Phenanthrene-d10	508519	16.756	494768	16.755	103	50 - 200	0.0010	+/-0.50	
Chrysene-d12	556407	21.094	529948	21.093	105	50 - 200	0.0010	+/-0.50	
Perylene-d12	435307	23.161	366072	23.149	119	50 - 200	0.0120	+/-0.50	
16WC1A (1504090-01)			Lab File ID: 1504090-01A60.d			Analyzed: 04/29/15 13:19			
1,4-Dichlorobenzene-d4	123818	6.975	111518	6.974	111	50 - 200	0.0010	+/-0.50	
Naphthalene-d8	456916	9.778	474377	9.778	96	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	256899	13.799	275063	13.798	93	50 - 200	0.0010	+/-0.50	
Phenanthrene-d10	441496	16.755	494768	16.755	89	50 - 200	0.0000	+/-0.50	
Chrysene-d12	467041	21.093	529948	21.093	88	50 - 200	0.0000	+/-0.50	
Perylene-d12	332780	23.16	366072	23.149	91	50 - 200	0.0110	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D APPIX

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D29001
Instrument: 5972hp60
Calibration: 5042901

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (5042414-MS1)			Lab File ID: 5042414-MS160.d			Analyzed: 04/29/15 14:01			
1,4-Dichlorobenzene-d4	120257	6.973	111518	6.974	108	50 - 200	-0.0010	+/-0.50	
Naphthalene-d8	487424	9.776	474377	9.778	103	50 - 200	-0.0020	+/-0.50	
Acenaphthene-d10	287480	13.797	275063	13.798	105	50 - 200	-0.0010	+/-0.50	
Phenanthrene-d10	539765	16.763	494768	16.755	109	50 - 200	0.0080	+/-0.50	
Chrysene-d12	617420	21.091	529948	21.093	117	50 - 200	-0.0020	+/-0.50	
Perylene-d12	423100	23.157	366072	23.149	116	50 - 200	0.0080	+/-0.50	
Matrix Spike Dup (5042414-MSD1)			Lab File ID: 5042414-MSD160.d			Analyzed: 04/29/15 14:43			
1,4-Dichlorobenzene-d4	77592	6.972	111518	6.974	70	50 - 200	-0.0020	+/-0.50	
Naphthalene-d8	316901	9.785	474377	9.778	67	50 - 200	0.0070	+/-0.50	
Acenaphthene-d10	190554	13.796	275063	13.798	69	50 - 200	-0.0020	+/-0.50	
Phenanthrene-d10	402233	16.762	494768	16.755	81	50 - 200	0.0070	+/-0.50	
Chrysene-d12	480055	21.09	529948	21.093	91	50 - 200	-0.0030	+/-0.50	
Perylene-d12	330716	23.156	366072	23.149	90	50 - 200	0.0070	+/-0.50	
16C1 (1504090-02)			Lab File ID: 1504090-02A60.d			Analyzed: 04/29/15 15:25			
1,4-Dichlorobenzene-d4	111392	6.975	111518	6.974	100	50 - 200	0.0010	+/-0.50	
Naphthalene-d8	419164	9.778	474377	9.778	88	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	216680	13.798	275063	13.798	79	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	401851	16.755	494768	16.755	81	50 - 200	0.0000	+/-0.50	
Chrysene-d12	429857	21.093	529948	21.093	81	50 - 200	0.0000	+/-0.50	
Perylene-d12	284730	23.159	366072	23.149	78	50 - 200	0.0100	+/-0.50	
16MW8 (1504090-03)			Lab File ID: 1504090-03A60.d			Analyzed: 04/29/15 16:07			
1,4-Dichlorobenzene-d4	101496	6.976	111518	6.974	91	50 - 200	0.0020	+/-0.50	
Naphthalene-d8	363783	9.779	474377	9.778	77	50 - 200	0.0010	+/-0.50	
Acenaphthene-d10	196219	13.8	275063	13.798	71	50 - 200	0.0020	+/-0.50	
Phenanthrene-d10	355066	16.756	494768	16.755	72	50 - 200	0.0010	+/-0.50	
Chrysene-d12	388650	21.094	529948	21.093	73	50 - 200	0.0010	+/-0.50	
Perylene-d12	250979	23.161	366072	23.149	69	50 - 200	0.0120	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D APPIX

Laboratory: COMPUCHEM
SDG: 1504090
Client: DRAPER ADEN ASSOCIATES
Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13
Sequence: 5D29001
Instrument: 5972hp60
Calibration: 5042901

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
16MW9 (1504090-04)			Lab File ID: 1504090-04A60.d			Analyzed: 04/29/15 16:49			
1,4-Dichlorobenzene-d4	180954	6.981	111518	6.974	162	50 - 200	0.0070	+/-0.50	
Naphthalene-d8	726131	9.784	474377	9.778	153	50 - 200	0.0060	+/-0.50	
Acenaphthene-d10	408201	13.805	275063	13.798	148	50 - 200	0.0070	+/-0.50	
Phenanthrene-d10	710278	16.761	494768	16.755	144	50 - 200	0.0060	+/-0.50	
Chrysene-d12	740600	21.099	529948	21.093	140	50 - 200	0.0060	+/-0.50	
Perylene-d12	510447	23.155	366072	23.149	139	50 - 200	0.0060	+/-0.50	
16WDUP (1504090-05)			Lab File ID: 1504090-05A60.d			Analyzed: 04/29/15 17:31			
1,4-Dichlorobenzene-d4	99941	6.975	111518	6.974	90	50 - 200	0.0010	+/-0.50	
Naphthalene-d8	364159	9.788	474377	9.778	77	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	195165	13.799	275063	13.798	71	50 - 200	0.0010	+/-0.50	
Phenanthrene-d10	336325	16.755	494768	16.755	68	50 - 200	0.0000	+/-0.50	
Chrysene-d12	341455	21.093	529948	21.093	64	50 - 200	0.0000	+/-0.50	
Perylene-d12	219333	23.16	366072	23.149	60	50 - 200	0.0110	+/-0.50	
16WC1B (1504090-06)			Lab File ID: 1504090-06A60.d			Analyzed: 04/29/15 18:13			
1,4-Dichlorobenzene-d4	134194	6.977	111518	6.974	120	50 - 200	0.0030	+/-0.50	
Naphthalene-d8	515299	9.78	474377	9.778	109	50 - 200	0.0020	+/-0.50	
Acenaphthene-d10	277379	13.8	275063	13.798	101	50 - 200	0.0020	+/-0.50	
Phenanthrene-d10	498853	16.757	494768	16.755	101	50 - 200	0.0020	+/-0.50	
Chrysene-d12	542226	21.095	529948	21.093	102	50 - 200	0.0020	+/-0.50	
Perylene-d12	365959	23.161	366072	23.149	100	50 - 200	0.0120	+/-0.50	

K. Target Compound Results

(ANALYSIS DATA SHEETS)

Analysis Data Sheets (ADS), Tentatively Identified Compounds (TICs), and Surrogate Recovery Results

Sample data shall be arranged in packets with the Analysis Data Sheet, followed by the raw data for volatile or semivolatile samples. These sample packets shall be placed in increasing Client Sample ID number order, considering both letters and numbers.

a. Target Analyte Results (ANALYSIS DATA SHEET)

Tabulated results (identification and quantitation) and Tentatively Identified Compounds (TICs) shall be included.

b. Reconstructed Ion Chromatograms (RICs)

Include for each sample or sample extract, including dilutions and reanalyses. The RIC shall contain the following header information: Client Sample ID Number, date and time of analysis, instrument ID, Lab file ID, and analyst ID.

d. Quantitation Report for target analytes and TICs.

Include a printout of the Extracted Ion Current Profile (EICP) for all manual changes to all compounds, internal standards, and surrogate compounds.

e. Copies of raw spectra and copies of background-subtracted mass spectra of target analytes plus TICs identified in the sample.

- The spectra shall include the following information: Client Sample ID number, Lab file ID, date and time of analysis, and instrument ID.
- The compound name must be clearly marked.

ANALYSIS DATA SHEET

SW8270D

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02S66.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 17:58

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02S66.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 17:58

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate		0.52	5.0	*U*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	65.07	65	33 - 110	
Phenol-d5	100.0	37.52	38	20 - 110	
Nitrobenzene-d5	50.00	47.51	95	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02S66.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 17:58

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	43.34	87	46 - 110	
2,4,6-Tribromophenol	100.0	93.57	94	42 - 119	
Terphenyl-d14	50.00	51.26	103	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03S66.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 18:38

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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SW8270D

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03S66.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 18:38

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate		0.52	5.0	*U*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	56.05	56	33 - 110	
Phenol-d5	100.0	32.17	32	20 - 110	
Nitrobenzene-d5	50.00	43.61	87	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03S66.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 18:38

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	39.64	79	46 - 110	
2,4,6-Tribromophenol	100.0	89.66	90	42 - 119	
Terphenyl-d14	50.00	48.38	97	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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SW8270D

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04S66.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:17

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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SW8270D

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04S66.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:17

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate	0.89	0.52	5.0	*J*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	56.95	57	33 - 110	
Phenol-d5	100.0	32.24	32	20 - 110	
Nitrobenzene-d5	50.00	39.50	79	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04S66.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:17

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	39.28	79	46 - 110	
2,4,6-Tribromophenol	100.0	81.16	81	42 - 119	
Terphenyl-d14	50.00	47.97	96	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01S66.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 16:00

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01S66.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 16:00

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate		0.52	5.0	*U*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	62.54	63	33 - 110	
Phenol-d5	100.0	36.57	37	20 - 110	
Nitrobenzene-d5	50.00	44.98	90	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01S66.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 16:00

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	42.05	84	46 - 110	
2,4,6-Tribromophenol	100.0	93.56	94	42 - 119	
Terphenyl-d14	50.00	48.26	97	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06S66.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 20:36

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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SW8270D

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06S66.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 20:36

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate		0.52	5.0	*U*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	57.63	58	33 - 110	
Phenol-d5	100.0	33.64	34	20 - 110	
Nitrobenzene-d5	50.00	41.24	82	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06S66.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 20:36

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	39.16	78	46 - 110	
2,4,6-Tribromophenol	100.0	83.37	83	42 - 119	
Terphenyl-d14	50.00	47.36	95	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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SW8270D

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05S66.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:56

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	*U*
110-86-1	Pyridine		1.1	5.0	*U*
108-95-2	Phenol		0.62	10	*U*
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	*U*
95-57-8	2-Chlorophenol		1.4	10	*U*
95-48-7	2-Methylphenol		2.2	10	*U*
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	*U*
106-44-5	3 & 4-Methylphenol		1.7	10	*U*
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	*U*
98-86-2	Acetophenone		1.2	5.0	*U*
67-72-1	Hexachloroethane		1.1	5.0	*U*
98-95-3	Nitrobenzene		1.3	5.0	*U*
78-59-1	Isophorone		0.94	5.0	*U*
88-75-5	2-Nitrophenol		0.99	10	*U*
105-67-9	2,4-Dimethylphenol		4.8	10	*U*
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	*U*
120-83-2	2,4-Dichlorophenol		1.6	10	*U*
106-47-8	4-Chloroaniline		1.1	10	*U*
59-50-7	4-Chloro-3-methylphenol		0.82	10	*U*
91-57-6	2-Methylnaphthalene		1.1	5.0	*U*
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	*U*
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	*U*
88-06-2	2,4,6-Trichlorophenol		0.89	10	*U*
95-95-4	2,4,5-Trichlorophenol		1.5	10	*U*
91-58-7	2-Chloronaphthalene		1.0	5.0	*U*
88-74-4	2-Nitroaniline		1.5	10	*U*
131-11-3	Dimethylphthalate		0.64	5.0	*U*
606-20-2	2,6-Dinitrotoluene		0.75	5.0	*U*
208-96-8	Acenaphthylene		0.96	5.0	*U*
99-09-2	3-Nitroaniline		0.83	10	*U*
83-32-9	Acenaphthene		0.80	5.0	*U*
51-28-5	2,4-Dinitrophenol		2.1	10	*U*
100-02-7	4-Nitrophenol		2.3	10	*U*
121-14-2	2,4-Dinitrotoluene		0.84	5.0	*U*
132-64-9	Dibenzofuran		0.76	5.0	*U*

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SW8270D

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05S66.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:56

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	*U*
84-66-2	Diethylphthalate		0.52	5.0	*U*
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	*U*
86-73-7	Fluorene		0.71	5.0	*U*
100-01-6	4-Nitroaniline		2.7	10	*U*
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	*U*
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	*U*
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	*U*
118-74-1	Hexachlorobenzene		0.57	5.0	*U*
87-86-5	Pentachlorophenol		2.6	10	*U*
85-01-8	Phenanthrene		0.70	5.0	*U*
120-12-7	Anthracene		0.77	5.0	*U*
84-74-2	Di-n-butylphthalate		0.74	5.0	*U*
206-44-0	Fluoranthene		0.58	5.0	*U*
129-00-0	Pyrene		0.73	5.0	*U*
85-68-7	Butylbenzylphthalate		0.55	5.0	*U*
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	*U*
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	*U*
56-55-3	Benzo (a) anthracene		0.57	5.0	*U*
218-01-9	Chrysene		2.2	5.0	*U*
117-84-0	Di-n-octylphthalate		0.71	5.0	*U*
205-99-2	Benzo (b) fluoranthene		0.68	5.0	*U*
207-08-9	Benzo(k)fluoranthene		1.5	5.0	*U*
50-32-8	Benzo (a) pyrene		0.70	5.0	*U*
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	*U*
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	*U*
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	*U*
99-65-0	1,3-Dinitrobenzene		1.1	5.0	*U*
62-53-3	Aniline		1.8	5.0	*U*
100-51-6	Benzyl alcohol		1.1	5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	59.68	60	33 - 110	
Phenol-d5	100.0	34.68	35	20 - 110	
Nitrobenzene-d5	50.00	42.19	84	45 - 110	

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ANALYSIS DATA SHEET

SW8270D

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05S66.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:56

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	39.10	78	46 - 110	
2,4,6-Tribromophenol	100.0	85.73	86	42 - 119	
Terphenyl-d14	50.00	45.78	92	59 - 110	

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02P70.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 18:21

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03P70.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:04

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04P70.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 19:46

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01P70.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 17:39

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06P70.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 21:09

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D ADD

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05P70.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 20:27

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	*U*
52-85-7	Famphur		0.59	5.0	*U*
143-50-0	Kepone		0.54	5.0	*U*
70-30-4	Hexachlorophene		40	100	*U*

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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SW8270D APPIX

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02A60.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 15:25

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D APPIX

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-02A60.d Sampled: 04/22/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 15:25

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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SW8270D APPIX

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03A60.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 16:07

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

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SW8270D APPIX

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-03A60.d Sampled: 04/22/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 16:07

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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SW8270D APPIX

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04A60.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 16:49

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

ANALYSIS DATA SHEET

SW8270D APPIX

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-04A60.d Sampled: 04/22/15 11:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 16:49

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ANALYSIS DATA SHEET

SW8270D APPIX

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01A60.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 13:19

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D APPIX

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-01A60.d Sampled: 04/22/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 13:19

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D APPIX

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06A60.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 18:13

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D APPIX

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-06A60.d Sampled: 04/22/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-06 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 18:13

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D APPIX

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05A60.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 17:31

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	*U*
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	*U*
66-27-3	Methyl Methanesulfonate		0.78	5.0	*U*
55-18-5	N-Nitrosodiethylamine		0.78	5.0	*U*
62-50-0	Ethyl Methanesulfonate		1.1	5.0	*U*
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	*U*
59-89-2	N-Nitrosomorpholine		0.85	5.0	*U*
95-53-4	o-Toluidine		0.46	5.0	*U*
100-75-4	N-Nitrosopiperidine		0.35	5.0	*U*
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	*U*
87-65-0	2,6-Dichlorophenol		0.42	10	*U*
1888-71-7	Hexachloropropene		0.50	5.0	*U*
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	*U*
94-59-7	Safrole		0.37	5.0	*U*
120-58-1	Isosafrole		0.47	5.0	*U*
130-15-4	1,4-Naphthoquinone		0.28	5.0	*U*
608-93-5	Pentachlorobenzene		0.75	5.0	*U*
134-32-7	1-Naphthylamine		0.59	5.0	*U*
91-59-8	2-Naphthylamine		0.45	5.0	*U*
297-97-2	Zinophos		0.75	5.0	*U*
99-55-8	5-Nitro-o-toluidine		0.37	5.0	*U*
3689-24-5	Sulfotep		0.52	5.0	*U*
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	*U*
298-02-2	Phorate		0.47	5.0	*U*
62-44-2	Phenacetin		0.38	5.0	*U*
60-51-5	Dimethoate		0.39	5.0	*U*
92-67-1	4-Aminobiphenyl		0.35	5.0	*U*
82-68-8	Pentachloronitrobenzene		0.44	5.0	*U*
23950-58-5	Pronamide		0.27	5.0	*U*
298-04-4	Disulfoton		0.45	5.0	*U*
298-00-0	Methyl Parathion		0.52	5.0	*U*
56-38-2	Parathion		0.43	5.0	*U*
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	*U*
91-80-5	Methapyrilene		1.4	5.0	*U*
465-73-6	Isodrin		0.52	5.0	*U*

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ANALYSIS DATA SHEET

SW8270D APPIX

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504090-05A60.d Sampled: 04/22/15 13:55

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504090-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 17:31

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	*U*
510-15-6	Chlorobenzilate		0.34	5.0	*U*
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	*U*
53-96-3	2-Acetylaminofluorene		0.82	5.0	*U*
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	*U*
56-49-5	3-Methylcholanthrene		0.26	5.0	*U*
2303-16-4	Diallate		0.92	10	*U*
122-09-8	a,a-Dimethylphenethylamine		3.8	15	*U*
140-57-8	Aramite		0.84	5.0	*U*

CAS NO.	TICS	CONC. (ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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INITIAL CALIBRATION DATA

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
N-Nitrosodimethylamine	5	1.091822	10	1.118144	25	1.152396	40	1.124729	50	1.125668	60	1.181513
Pyridine	5	1.420276	10	1.375596	25	1.501907	40	1.530403	50	1.548418	60	1.512381
Phenol	5	1.637445	10	1.597161	25	1.62381	40	1.65714	50	1.611156	60	1.611949
Bis(2-chloroethyl)ether	5	1.527996	10	1.275972	25	1.355843	40	1.368323	50	1.311512	60	1.30297
2-Chlorophenol	5	1.294091	10	1.302375	25	1.325712	40	1.372805	50	1.337922	60	1.331346
2-Methylphenol	5	1.172802	10	1.14224	25	1.246953	40	1.188675	50	1.158029	60	1.168532
2,2'-oxybis(1-Chloropropane)	5	2.325952	10	2.021876	25	2.140357	40	2.154777	50	2.082811	60	2.075537
3 & 4-Methylphenol	5	1.393462	10	1.216946	25	1.327767	40	1.328598	50	1.26816	60	1.332999
N-Nitroso-di-N-propylamine	5	1.080197	10	0.9373731	25	1.039391	40	1.072279	50	0.9796639	60	1.055643
Acetophenone	5	0.4267177	10	0.4477522	25	0.452073	40	0.4689239	50	0.4938018	60	0.4873654
Hexachloroethane	5	0.7333159	10	0.7037598	25	0.7660217	40	0.7543853	50	0.7671762	60	0.7402309
Nitrobenzene	5	0.3810878	10	0.4117267	25	0.4077737	40	0.3936675	50	0.4130857	60	0.4040921
Isophorone	5	0.6593105	10	0.6529201	25	0.7154692	40	0.6986619	50	0.7160175	60	0.7228444
2-Nitrophenol	5	0.1479086	10	0.1727894	25	0.1936865	40	0.1978398	50	0.2028583	60	0.2099137
2,4-Dimethylphenol	5	0.2628765	10	0.2648598	25	0.2826999	40	0.2874897	50	0.2888663	60	0.2774676
Bis(2-chloroethoxy)methane	5	0.439016	10	0.4247066	25	0.4533738	40	0.4307841	50	0.4503185	60	0.432616
2,4-Dichlorophenol	5	0.2918006	10	0.3204807	25	0.32795	40	0.3305072	50	0.3378191	60	0.3345859
4-Chloroaniline	5	0.4368567	10	0.482061	25	0.4834736	40	0.470292	50	0.4882793	60	0.4609776
4-Chloro-3-methylphenol	5	0.2459485	10	0.2740943	25	0.3043276	40	0.3062957	50	0.3209636	60	0.3155553
2-Methylnaphthalene	5	0.5905501	10	0.5829894	25	0.5922824	40	0.5700511	50	0.5838149	60	0.5491989
Hexachlorocyclopentadiene	5	0.3833178	10	0.4246697	25	0.4408111	40	0.456444	50	0.4632093	60	0.4860481
1,2,4,5-Tetrachlorobenzene	5	0.6786658	10	0.670403	25	0.6330944	40	0.6395679	50	0.6473375	60	0.6435135
2,4,6-Trichlorophenol	5	0.2909983	10	0.3741444	25	0.3906466	40	0.3994203	50	0.4029405	60	0.4184141
2,4,5-Trichlorophenol	5	0.370733	10	0.4234597	25	0.4466043	40	0.4578398	50	0.4482985	60	0.4671078
2-Chloronaphthalene	5	1.188667	10	1.177215	25	1.134293	40	1.141124	50	1.181063	60	1.150437
2-Nitroaniline	5	0.418611	10	0.43264	25	0.4729203	40	0.4798373	50	0.5246099	60	0.5011019
Dimethylphthalate	5	1.381619	10	1.359943	25	1.413204	40	1.387626	50	1.50708	60	1.434467

Environmental Testing Laboratories

CompuChem

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INITIAL CALIBRATION DATA

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
2,6-Dinitrotoluene	5	0.2530117	10	0.3038136	25	0.3125104	40	0.3064479	50	0.3584601	60	0.3314056
Acenaphthylene	5	1.666069	10	1.717985	25	1.698737	40	1.672901	50	1.736163	60	1.681125
3-Nitroaniline	5	0.3101464	10	0.3471571	25	0.354672	40	0.3554719	50	0.3910098	60	0.3708715
Acenaphthene	5	1.073253	10	1.164296	25	1.163103	40	1.135675	50	1.146603	60	1.139059
2,4-Dinitrophenol	5	3.899275E-02	10	8.029979E-02	25	0.1350638	40	0.1523144	50	0.1775881	60	0.2305257
4-Nitrophenol	5	0.1832922	10	0.2355236	25	0.2885671	40	0.2956549	50	0.3302188	60	0.3393152
2,4-Dinitrotoluene	5	0.3047905	10	0.3694067	25	0.4262929	40	0.4351384	50	0.4650856	60	0.4583921
Dibenzofuran	5	1.684877	10	1.675448	25	1.683134	40	1.652547	50	1.755585	60	1.650182
2,3,4,6-Tetrachlorophenol	5	0.3066326	10	0.3822292	25	0.3993473	40	0.3752767	50	0.4111821	60	0.4067753
Diethylphthalate	5	1.415875	10	1.487223	25	1.469259	40	1.465198	50	1.587364	60	1.469072
4-Chlorophenyl-phenylether	5	0.619751	10	0.6414652	25	0.6163712	40	0.6162228	50	0.6618433	60	0.6136619
Fluorene	5	1.174318	10	1.207242	25	1.212434	40	1.198693	50	1.298932	60	1.187434
4-Nitroaniline	5	0.2641569	10	0.3136442	25	0.3528828	40	0.3405723	50	0.3892725	60	0.3733431
4,6-Dinitro-2-methylphenol	5	5.632458E-02	10	8.158109E-02	25	0.1216957	40	0.1330933	50	0.1374735	60	0.1595441
N-Nitrosodiphenylamine (1)	5	0.571509	10	0.6202998	25	0.6112942	40	0.5998513	50	0.6137707	60	0.5820466
4-Bromophenyl-phenylether	5	0.2115092	10	0.2359637	25	0.2314693	40	0.231451	50	0.2309736	60	0.2221547
Hexachlorobenzene	5	0.3265802	10	0.316751	25	0.3019158	40	0.301229	50	0.3002927	60	0.287925
Pentachlorophenol	5	7.672252E-02	10	0.1261826	25	0.1635158	40	0.1741999	50	0.1753372	60	0.1846324
Phenanthrene	5	1.061119	10	1.103267	25	1.079709	40	1.077355	50	1.102884	60	1.021779
Anthracene	5	0.9611846	10	1.081565	25	1.076268	40	1.071097	50	1.070079	60	1.026849
Di-n-butylphthalate	5	1.252776	10	1.371177	25	1.493599	40	1.422488	50	1.452474	60	1.420241
Fluoranthene	5	1.081364	10	1.206434	25	1.202745	40	1.153728	50	1.198326	60	1.09525
Pyrene	5	0.9769659	10	1.044761	25	1.065808	40	1.05002	50	1.053408	60	1.012405
Butylbenzylphthalate	5	0.409248	10	0.4940304	25	0.5444242	40	0.5572062	50	0.5618964	60	0.5881976
3,3'-Dichlorobenzidine	5	0.316369	10	0.3592598	25	0.371433	40	0.4176366	50	0.4210119	60	0.4288104
bis(2-ethylhexyl)Phthalate	5	0.5675528	10	0.6970205	25	0.764793	40	0.7631767	50	0.7718619	60	0.8291579
Benzo (a) anthracene	5	0.9119732	10	0.9162395	25	0.9513233	40	0.9531985	50	0.9798744	60	0.976228

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

INITIAL CALIBRATION DATA

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Chrysene	5	0.9002714	10	0.9170435	25	0.9048452	40	0.8902443	50	0.9073867	60	0.8822583
Di-n-octylphthalate	5	1.098193	10	1.519179	25	1.784599	40	1.84519	50	1.805543	60	1.943139
Benzo (b) fluoranthene	5	1.310946	10	1.554312	25	1.414011	40	1.47885	50	1.400594	60	1.419265
Benzo(k)fluoranthene	5	1.573217	10	1.514132	25	1.648921	40	1.428787	50	1.56934	60	1.350208
Benzo (a) pyrene	5	1.269027	10	1.336544	25	1.393891	40	1.404314	50	1.403354	60	1.346417
Indeno(1,2,3-cd)pyrene	5	1.090668	10	1.167199	25	1.264751	40	1.241097	50	1.282767	60	1.297477
Dibenzo(a,h)anthracene	5	1.154996	10	1.293594	25	1.40169	40	1.288217	50	1.402321	60	1.349201
Benzo (g,h,i) perylene	5	1.308186	10	1.332464	25	1.360263	40	1.359868	50	1.359561	60	1.318984
1,3-Dinitrobenzene	5	5.612851E-02	10	0.0750444	25	8.054285E-02	40	8.702424E-02	50	9.697812E-02	60	9.406013E-02
Aniline	5	2.057855	10	1.96188	25	2.028672	40	2.083973	50	1.97652	60	2.007223
Benzyl alcohol	5	0.8054778	10	0.7843424	25	0.840666	40	0.8534455	50	0.7996516	60	0.8718945
2-Fluorophenol	5	1.043738	10	1.081313	25	1.209589	40	1.243145	50	1.249705	60	1.236287
Phenol-d5	5	1.41934	10	1.403164	25	1.515065	40	1.530975	50	1.49116	60	1.490777
Nitrobenzene-d5	5	0.3356	10	0.3676778	25	0.3786647	40	0.3849323	50	0.3961878	60	0.3869809
2-Fluorobiphenyl	5	1.301265	10	1.282714	25	1.263109	40	1.287132	50	1.296097	60	1.261813
2,4,6-Tribromophenol	5	0.2545751	10	0.2891611	25	0.3230004	40	0.3301011	50	0.3613092	60	0.3435551
Terphenyl-d14	5	0.677909	10	0.7315459	25	0.7554064	40	0.7386834	50	0.7516484	60	0.7314786

INITIAL CALIBRATION DATA (Continued)

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
N-Nitrosodimethylamine	1.132379	2.72641	2.529	0.2108893			CCC (20)	
Pyridine	1.481497	4.598234	2.565	0.2876103			CCC (20)	
Phenol	1.62311	1.322689	7.251	5.592353E-02			CCC (20)	
Bis(2-chloroethyl)ether	1.357103	6.666319	7.3245	0.0500351			CCC (20)	
2-Chlorophenol	1.327375	2.111218	7.351667	4.030557E-02			CCC (20)	
2-Methylphenol	1.179539	3.091471	8.552667	5.906555E-02			CCC (20)	
2,2'-oxybis(1-Chloropropane)	2.133552	4.95702	8.550833	4.293638E-02			CCC (20)	
3 & 4-Methylphenol	1.311322	4.64562	8.922167	3.669013E-02			CCC (20)	
N-Nitroso-di-N-propylamine	1.027424	5.527595	8.813333	7.608622E-02			CCC (20)	
Acetophenone	0.4627723	5.505401	8.717833	0.0395133			CCC (20)	
Hexachloroethane	0.7441483	3.223751	8.878	4.177698E-02			CCC (20)	
Nitrobenzene	0.4019056	3.071451	9.055	3.489821E-02			CCC (20)	
Isophorone	0.6942039	4.411824	9.651333	6.914299E-02			CCC (20)	
2-Nitrophenol	0.1874994	12.31835	9.794333	3.184754E-02			CCC (20)	
2,4-Dimethylphenol	0.2773766	4.045408	10.096	4.783523E-02			CCC (20)	
Bis(2-chloroethoxy)methane	0.4384692	2.59154	10.27167	3.320927E-02			CCC (20)	
2,4-Dichlorophenol	0.3238572	5.185346	10.394	3.527576E-02			CCC (20)	
4-Chloroaniline	0.4703234	4.079281	10.88467	3.065092E-02			CCC (20)	
4-Chloro-3-methylphenol	0.2945308	9.785101	12.19283	3.471131E-02			CCC (20)	
2-Methylnaphthalene	0.5781478	2.802665	12.295	2.804782E-02			CCC (20)	
Hexachlorocyclopentadiene	0.4424167	8.050647	12.74317	2.187295E-02			CCC (20)	
1,2,4,5-Tetrachlorobenzene	0.652097	2.790341	12.71083	2.847484E-02			CCC (20)	
2,4,6-Trichlorophenol	0.3794274	12.04653	13.04117	2.635348E-02			CCC (20)	
2,4,5-Trichlorophenol	0.4356739	8.033389	13.123	2.458747E-02			CCC (20)	
2-Chloronaphthalene	1.162133	1.978392	13.399	2.158837E-02			CCC (20)	
2-Nitroaniline	0.4716201	8.521458	13.71933	4.782135E-02			CCC (20)	
Dimethylphthalate	1.41399	3.708664	14.29867	5.915163E-02			CCC (20)	

INITIAL CALIBRATION DATA (Continued)

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
2,6-Dinitrotoluene	0.3109416	11.23877	14.34967	6.058479E-02			CCC (20)	
Acenaphthylene	1.695497	1.615805	14.3375	3.605589E-02			CCC (20)	
3-Nitroaniline	0.3548881	7.584216	14.67667	5.709593E-02			CCC (20)	
Acenaphthene	1.136998	2.940344	14.73967	2.662176E-02			CCC (20)	
2,4-Dinitrophenol	0.1357974	50.42467	14.91167	1.876251E-02		0.9995605	CCC (20)	
4-Nitrophenol	0.278762	21.33158	15.232	3.200183E-02		0.9989678	CCC (20)	
2,4-Dinitrotoluene	0.409851	15.0368	15.203	3.776314E-02	0.9987893		CCC (20)	
Dibenzofuran	1.683629	2.274312	15.1245	3.227468E-02			CCC (20)	
2,3,4,6-Tetrachlorophenol	0.3802405	10.16745	15.44817	4.055595E-02			CCC (20)	
Diethylphthalate	1.482332	3.82959	15.82133	5.393093E-02			CCC (20)	
4-Chlorophenyl-phenylether	0.6282192	3.081677	15.91317	2.234066E-02			CCC (20)	
Fluorene	1.213175	3.644076	15.811	1.893062E-02			CCC (20)	
4-Nitroaniline	0.3389786	13.28918	15.9235	8.763246E-02			CCC (20)	
4,6-Dinitro-2-methylphenol	0.114952	33.51438	16.00533	5.326477E-02		0.998673	CCC (20)	
N-Nitrosodiphenylamine (1)	0.5997953	3.218337	16.15533	3.112831E-02			CCC (20)	
4-Bromophenyl-phenylether	0.2272536	3.930783	16.81267	2.448201E-02			CCC (20)	
Hexachlorobenzene	0.3057823	4.478163	16.86383	1.794303E-02			CCC (20)	
Pentachlorophenol	0.1500984	27.54437	17.254	1.813283E-02	0.9990048		CCC (20)	
Phenanthrene	1.074352	2.831483	17.557	3.254481E-02			CCC (20)	
Anthracene	1.04784	4.462166	17.64233	2.140447E-02			CCC (20)	
Di-n-butylphthalate	1.402126	5.959253	18.758	0.0183877			CCC (20)	
Fluoranthene	1.156308	4.859316	19.557	2.781764E-02			CCC (20)	
Pyrene	1.033895	3.202074	19.903	1.308171E-02			CCC (20)	
Butylbenzylphthalate	0.5258338	12.36083	21.15667	1.159165E-02			CCC (20)	
3,3'-Dichlorobenzidine	0.3857534	11.49707	21.89267	1.777614E-02			CCC (20)	
bis(2-ethylhexyl)Phthalate	0.7322605	12.41783	22.1615	1.665501E-02			CCC (20)	
Benzo (a) anthracene	0.9481395	3.041239	21.855	1.808254E-02			CCC (20)	

INITIAL CALIBRATION DATA (Continued)

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
Chrysene	0.9003416	1.38533	21.90767	2.476901E-02			CCC (20)	
Di-n-octylphthalate	1.665974	18.7219	23.1395	1.716637E-02	0.9976646		CCC (20)	
Benzo (b) fluoranthene	1.429663	5.70384	23.4545	1.591415E-02			CCC (20)	
Benzo(k)fluoranthene	1.514101	7.166008	23.49033	2.808102E-02			CCC (20)	
Benzo (a) pyrene	1.358925	3.893279	23.884	1.917037E-02			CCC (20)	
Indeno(1,2,3-cd)pyrene	1.223993	6.516465	25.3095	2.871225E-02			CCC (20)	
Dibenzo(a,h)anthracene	1.315003	7.059268	25.359	2.837002E-02			CCC (20)	
Benzo (g,h,i) perylene	1.339888	1.733891	25.65867	4.196966E-02			CCC (20)	
1,3-Dinitrobenzene	8.162971E-02	18.28601	14.237	5.781742E-02	0.9954557		CCC (20)	
Aniline	2.019354	2.325883	7.099667	0.0496559			CCC (20)	
Benzyl alcohol	0.825913	4.168104	8.1865	4.295559E-02			CCC (20)	
2-Fluorophenol	1.177296	7.705965	5.157667	7.087591E-02			CCC (20)	
Phenol-d5	1.47508	3.523541	7.224	6.731201E-02			CCC (20)	
Nitrobenzene-d5	0.3750073	5.732318	9.014167	3.855882E-02			CCC (20)	
2-Fluorobiphenyl	1.282022	1.286947	13.24567	2.624517E-02			CCC (20)	
2,4,6-Tribromophenol	0.3169503	12.25855	16.28817	3.609925E-02			CCC (20)	
Terphenyl-d14	0.731112	3.820085	20.27933	0.016046			CCC (20)	

INITIAL CALIBRATION DATA

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042804 Instrument: 5972hp70

Calibration Date: 4/27/2015 11:20:00AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Famphur	5	0.3270027	10	0.3813167	25	0.4423674	40	0.4275079	60	0.4453105	80	0.4482264
Kepone	5	5.495726E-02	10	6.195001E-02	25	8.953146E-02	40	8.107461E-02	60	8.360256E-02	80	8.093919E-02

INITIAL CALIBRATION DATA (Continued)

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042804 Instrument: 5972hp70

Calibration Date: 4/27/2015 11:20:00AM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
Famphur	0.4119553	11.7678	20.79317	1.817121E-02			CCC (20)	
Kepone	7.534251E-02	18.08845	20.78967	2.528113E-02	0.9966959		CCC (20)	

INITIAL CALIBRATION DATA

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042806 Instrument: 5972hp70

Calibration Date: 4/27/2015 4:38:17PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
p-Phenylenediamine	5	0.7059734	10	0.7496017	25	0.882266	40	0.8620317	60	0.8479003	80	0.828905

INITIAL CALIBRATION DATA (Continued)

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042806 Instrument: 5972hp70

Calibration Date: 4/27/2015 4:38:17PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
p-Phenylenediamine	0.8127797	8.550098	11.3785	6.235549E-02			CCC (20)	

INITIAL CALIBRATION DATA

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042807 Instrument: 5972hp62

Calibration Date: 4/27/2015 11:36:17AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Hexachlorophene	400	3.383951E-02	600	3.666985E-02	800	3.590511E-02	1000	0.0374449	1200	3.743818E-02	1400	3.404686E-02

INITIAL CALIBRATION DATA (Continued)

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042807 Instrument: 5972hp62

Calibration Date: 4/27/2015 11:36:17AM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
Hexachlorophene	3.589074E-02	4.496892	23.34917	1.451085E-02			CCC (20)	

INITIAL CALIBRATION DATA

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042901 Instrument: 5972hp60

Calibration Date: 4/28/2015 11:26:04AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
2-Picoline	5	1.46188	10	1.489663	25	1.507116	40	1.475426	50	1.607144	60	1.583408
N-Nitrosomethylethylamine	5	0.7105933	10	0.6809426	25	0.753636	40	0.7535301	50	0.7160441	60	0.7342889
Methyl Methanesulfonate	5	0.9835982	10	1.003751	25	0.9879444	40	0.9577336	50	1.072531	60	0.8581756
N-Nitrosodiethylamine	5	0.6505854	10	0.6627171	25	0.7441499	40	0.6879281	50	0.7072418	60	0.6715728
Ethyl Methanesulfonate	5	1.345314	10	1.467443	25	1.533922	40	1.465015	50	1.5562	60	1.504445
N-Nitrosopyrrolidine	5	0.7212262	10	0.7453278	25	0.8789447	40	0.8043109	50	0.8301022	60	0.8026627
N-Nitrosomorpholine	5	0.2394661	10	0.2650427	25	0.2970874	40	0.2773662	50	0.2899684	60	0.2807069
o-Toluidine	5	2.113681	10	2.110523	25	2.409424	40	2.217128	50	2.324606	60	2.252483
N-Nitrosopiperidine	5	0.1766793	10	0.1862799	25	0.2024682	40	0.1906443	50	0.1896201	60	0.185258
o,o,o-Triethyl phosphorothioate	5	0.1432658	10	0.1328202	25	0.1492553	40	0.1391808	50	0.1476554	60	0.1249733
2,6-Dichlorophenol	5	0.2634095	10	0.2641664	25	0.3156446	40	0.3184594	50	0.2901555	60	0.2767554
Hexachloropropene	5	0.184058	10	0.1974869	25	0.2185145	40	0.2176658	50	0.2061332	60	0.1903999
N-Nitroso-di-n-butylamine	5	0.2502427	10	0.2315163	25	0.2680782	40	0.2736271	50	0.2605722	60	0.2446824
Safrole	5	0.2216762	10	0.2211855	25	0.2546323	40	0.2520772	50	0.2389443	60	0.228152
Isosafrole	5	6.479308E-02	10	6.938381E-02	25	7.720054E-02	40	7.902198E-02	50	8.881615E-02	60	7.461716E-02
1,4-Naphthoquinone	5	0.3290057	10	0.3725072	25	0.4440447	40	0.445457	50	0.4166518	60	0.439033
Pentachlorobenzene	5	0.527903	10	0.5676667	25	0.5755628	40	0.5932754	50	0.5811236	60	0.5706978
1-Naphthylamine	5	0.9566185	10	1.138814	25	1.296171	40	1.309135	50	1.300526	60	1.294241
2-Naphthylamine	5	0.9943166	10	1.11914	25	1.334632	40	1.322984	50	1.310691	60	1.347224
Zinophos	5	0.3197085	10	0.3884213	25	0.4287765	40	0.4486352	50	0.3971037	60	0.4128505
5-Nitro-o-toluidine	5	0.2398989	10	0.2995145	25	0.415271	40	0.4227411	50	0.3903836	60	0.4065319
Sulfotep	5	0.1444199	10	0.1566374	25	0.1972494	40	0.1901407	50	0.1881641	60	0.1945168
1,3,5-Trinitrobenzene	5	3.931542E-02	10	4.278236E-02	25	7.890571E-02	40	6.723801E-02	50	7.522008E-02	60	7.890835E-02
Phorate	5	0.1363304	10	0.1433676	25	0.161607	40	0.1389598	50	0.145661	60	0.1620521
Phenacetin	5	0.3070637	10	0.3552959	25	0.4792172	40	0.4525846	50	0.4378493	60	0.4473576
Dimethoate	5	0.3184786	10	0.3232978	25	0.3821858	40	0.3701745	50	0.3531222	60	0.3820183
4-Aminobiphenyl	5	0.6594707	10	0.7079516	25	0.7600196	40	0.7595639	50	0.8138801	60	0.8126377

Environmental Testing Laboratories
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INITIAL CALIBRATION DATA

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042901 Instrument: 5972hp60

Calibration Date: 4/28/2015 11:26:04AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Pentachloronitrobenzene	5	7.785561E-02	10	8.510499E-02	25	8.972726E-02	40	8.532071E-02	50	9.309523E-02	60	8.481268E-02
Pronamide	5	0.2917014	10	0.3124085	25	0.3729121	40	0.3596688	50	0.36952	60	0.3774097
Disulfoton	5	0.4029791	10	0.3925942	25	0.4555453	40	0.4496268	50	0.4229946	60	0.4655787
Methyl Parathion	5	0.2575912	10	0.2632948	25	0.321064	40	0.3183176	50	0.3249965	60	0.314775
Parathion	5	0.142374	10	0.1465266	25	0.1987981	40	0.1881357	50	0.1921666	60	0.1879183
4-Nitroquinoline-1-oxide	5	4.596819E-02	10	4.906114E-02	25	0.1152281	40	0.1171823	50	0.1153841	60	0.1208523
Methapyrilene	5	0.3142861	10	0.3217413	25	0.3158803	40	0.2814937	50	0.3959837	60	~~0.2363584~~
Isodrin	5	0.1399692	10	0.127224	25	0.1513833	40	0.1381201	50	0.1425265	60	0.1407619
p-Dimethylaminoazobenzene	5	0.1703842	10	0.1581479	25	0.2122407	40	0.1940694	50	0.1881119	60	0.1861093
Chlorobenzilate	5	0.2790213	10	0.2615172	25	0.3081528	40	0.2860941	50	0.2864205	60	0.2737788
3,3'-Dimethylbenzidine	5	0.4714073	10	0.3720933	25	0.2554191	40	0.2263444	50	~~9.537715E-02~~	60	0.2020687
2-Acetylaminofluorene	5	0.2989909	10	0.2999969	25	0.4479444	40	0.4308537	50	0.4010792	60	0.4230799
7,12-Dimethylbenz(a)anthracene	5	0.4929404	10	0.5575838	25	0.6768602	40	0.6627056	50	0.6174714	60	0.6835812
3-Methylcholanthrene	5	0.580922	10	0.616993	25	0.7482704	40	0.740712	50	0.7331419	60	0.7131712
Diallate	5	0.3447258	10	0.3651016	25	0.3843566	40	0.3418821	50	0.3600236	60	0.385441
a,a-Dimethylphenethylamine	5	0.774612	10	0.9178954	25	1.231005	40	1.3185	50	1.078033	60	1.196953
Aramite	5	5.494689E-02	10	0.0445656	25	6.925193E-02	40	6.587101E-02	50	6.568502E-02	60	6.341328E-02

INITIAL CALIBRATION DATA (Continued)

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042901 Instrument: 5972hp60

Calibration Date: 4/28/2015 11:26:04AM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
2-Picoline	1.520773	3.952182	2.903667	0.751821			CCC (20)	
N-Nitrosomethylethylamine	0.7248392	3.877205	3.197167	0.5361489			CCC (20)	
Methyl Methanesulfonate	0.977289	7.161939	3.860333	0.4690623			CCC (20)	
N-Nitrosodiethylamine	0.6873658	4.967579	4.678667	0.3816936			CCC (20)	
Ethyl Methanesulfonate	1.478723	5.044742	5.442333	0.290733			CCC (20)	
N-Nitrosopyrrolidine	0.7970957	7.164781	7.838167	0.1493726			CCC (20)	
N-Nitrosomorpholine	0.2749396	7.474983	7.962667	7.501739E-02			CCC (20)	
o-Toluidine	2.237974	5.258116	7.99	0.0340718			CCC (20)	
N-Nitrosopiperidine	0.1884916	4.477445	8.571667	0.1151008			CCC (20)	
o,o,o-Triethyl phosphorothioate	0.1395251	6.658921	9.466667	6.163752E-02			CCC (20)	
2,6-Dichlorophenol	0.2880985	8.496258	10.0805	5.579033E-02			CCC (20)	
Hexachloropropene	0.2023764	7.027144	10.077	2.665313E-02			CCC (20)	
N-Nitroso-di-n-butylamine	0.2547865	6.154286	10.98417	3.869754E-02			CCC (20)	
Safrole	0.2361113	6.283271	11.37617	2.799819E-02			CCC (20)	
Isosafrole	7.563879E-02	10.98715	12.05817	3.428731E-02			CCC (20)	
1,4-Naphthoquinone	0.4077832	11.62687	12.95867	2.168068E-02			CCC (20)	
Pentachlorobenzene	0.5693716	3.905317	14.20667	2.062717E-02			CCC (20)	
1-Naphthylamine	1.215918	11.72375	14.4555	1.296477E-02			CCC (20)	
2-Naphthylamine	1.238165	11.83047	14.63983	1.838052E-02			CCC (20)	
Zinophos	0.3992493	11.17017	15.18717	0.0226522			CCC (20)	
5-Nitro-o-toluidine	0.3623902	20.69711	15.11367	2.766395E-02	0.9956031		CCC (20)	
Sulfotep	0.1785214	12.46623	15.893	2.220402E-02			CCC (20)	
1,3,5-Trinitrobenzene	6.372832E-02	28.41774	16.0055	1.583375E-02		0.990821	CCC (20)	
Phorate	0.1479963	7.569245	16.01583	2.972043E-02			CCC (20)	
Phenacetin	0.413228	16.16192	16.0995	0.0360889	0.9965681		CCC (20)	
Dimethoate	0.3548795	8.01145	16.26983	2.633997E-02			CCC (20)	
4-Aminobiphenyl	0.7522539	8.004599	16.53417	2.104307E-02			CCC (20)	

INITIAL CALIBRATION DATA (Continued)

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Calibration: 5042901 Instrument: 5972hp60

Calibration Date: 4/28/2015 11:26:04AM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
Pentachloronitrobenzene	8.598608E-02	6.003413	16.51717	3.813575E-03			CCC (20)	
Pronamide	0.3472701	10.39686	16.795	1.976253E-02			CCC (20)	
Disulfoton	0.4315531	6.926509	16.96717	8.300447E-03			CCC (20)	
Methyl Parathion	0.3000065	10.29339	17.57767	2.671519E-02			CCC (20)	
Parathion	0.1759866	14.07966	18.27333	1.875626E-02			CCC (20)	
4-Nitroquinoline-1-oxide	9.394602E-02	38.35805	18.15067	2.429702E-02	0.9963725		CCC (20)	
Methapyrilene	0.325877	12.96135	18.4376	2.046175E-02			CCC (20)	
Isodrin	0.1399975	5.563296	18.55967	0.0155631			CCC (20)	
p-Dimethylaminoazobenzene	0.1848439	10.17804	19.78583	9.979554E-03			CCC (20)	
Chlorobenzilate	0.2824974	5.517603	19.91883	0.0106956			CCC (20)	
3,3'-Dimethylbenzidine	0.3054666	37.12115	20.3174	1.222352E-02	0.9957727		CCC (20)	
2-Acetylaminofluorene	0.3836575	17.44032	20.6945	0.0169779		0.9950733	CCC (20)	
7,12-Dimethylbenz(a)anthracene	0.6151904	12.38102	22.676	2.189553E-02			CCC (20)	
3-Methylcholanthrene	0.6888684	10.38428	23.571	2.363232E-02			CCC (20)	
Diallate	0.3635884	5.146675	16.164	1.542691E-02			CCC (20)	
a,a-Dimethylphenethylamine	1.086166	18.98804	10.094	3.354291			CCC (20)	
Aramite	6.062229E-02	15.21655	19.76517	1.392968E-02		0.9978609	CCC (20)	

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
N-Nitrosodimethylamine	25.00	24.1	-3.5	30.00
Pyridine	25.00	23.4	-6.4	30.00
Phenol	25.00	23.9	-4.4	30.00
Bis(2-chloroethyl)ether	25.00	24.2	-3.0	30.00
2-Chlorophenol	25.00	24.2	-3.2	30.00
2-Methylphenol	25.00	24.7	-1.1	30.00
2,2'-oxybis(1-Chloropropane)	25.00	24.3	-2.6	30.00
N-Nitroso-di-N-propylamine	25.00	24.3	-2.8	30.00
Acetophenone	25.00	23.8	-4.6	30.00
Hexachloroethane	25.00	24.9	-0.4	30.00
Nitrobenzene	25.00	24.7	-1.1	30.00
Isophorone	25.00	25.5	1.8	30.00
2-Nitrophenol	25.00	24.9	-0.6	30.00
2,4-Dimethylphenol	25.00	24.8	-0.7	30.00
Bis(2-chloroethoxy)methane	25.00	25.4	1.5	30.00
2,4-Dichlorophenol	25.00	24.9	-0.2	30.00
4-Chloroaniline	25.00	25.4	1.7	30.00
4-Chloro-3-methylphenol	25.00	25.4	1.8	30.00
2-Methylnaphthalene	25.00	25.4	1.8	30.00
Hexachlorocyclopentadiene	25.00	24.9	-0.4	30.00
1,2,4,5-Tetrachlorobenzene	25.00	26.0	4.0	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
2,4,6-Trichlorophenol	25.00	25.6	2.6	30.00
2,4,5-Trichlorophenol	25.00	24.5	-2.1	30.00
2-Chloronaphthalene	25.00	26.4	5.5	30.00
2-Nitroaniline	25.00	24.7	-1.3	30.00
Dimethylphthalate	25.00	25.4	1.5	30.00
2,6-Dinitrotoluene	25.00	25.0	-0.1	30.00
Acenaphthylene	25.00	26.1	4.3	30.00
3-Nitroaniline	25.00	25.5	1.8	30.00
Acenaphthene	25.00	26.0	4.1	30.00
2,4-Dinitrophenol	25.00	24.9	-0.3	30.00
4-Nitrophenol	25.00	25.6	2.4	30.00
2,4-Dinitrotoluene	25.00	24.9	-0.2	30.00
Dibenzofuran	25.00	25.4	1.8	30.00
2,3,4,6-Tetrachlorophenol	25.00	25.7	2.7	30.00
Diethylphthalate	25.00	25.1	0.4	30.00
4-Chlorophenyl-phenylether	25.00	25.1	0.4	30.00
Fluorene	25.00	25.3	1.3	30.00
4-Nitroaniline	25.00	25.7	2.8	30.00
4,6-Dinitro-2-methylphenol	25.00	26.5	6.0	30.00
N-Nitrosodiphenylamine (1)	25.00	25.5	2.1	30.00
4-Bromophenyl-phenylether	25.00	25.1	0.4	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Hexachlorobenzene	25.00	25.2	0.9	30.00
Pentachlorophenol	25.00	24.4	-2.4	30.00
Phenanthrene	25.00	25.6	2.6	30.00
Anthracene	25.00	26.1	4.6	30.00
Di-n-butylphthalate	25.00	26.4	5.4	30.00
Fluoranthene	25.00	25.5	2.2	30.00
Pyrene	25.00	26.6	6.6	30.00
Butylbenzylphthalate	25.00	26.1	4.4	30.00
3,3'-Dichlorobenzidine	25.00	23.5	-5.8	30.00
bis(2-ethylhexyl)Phthalate	25.00	25.7	3.0	30.00
Benzo (a) anthracene	25.00	25.5	1.9	30.00
Chrysene	25.00	25.6	2.4	30.00
Di-n-octylphthalate	25.00	24.4	-2.5	30.00
Benzo (b) fluoranthene	25.00	26.3	5.2	30.00
Benzo(k)fluoranthene	25.00	24.9	-0.6	30.00
Benzo (a) pyrene	25.00	25.6	2.3	30.00
Indeno(1,2,3-cd)pyrene	25.00	25.4	1.5	30.00
Dibenzo(a,h)anthracene	25.00	25.9	3.7	30.00
Benzo (g,h,i) perylene	25.00	25.8	3.3	30.00
1,3-Dinitrobenzene	25.00	23.1	-7.4	30.00
Aniline	25.00	24.2	-3.2	30.00

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ACCREDITED IN ACCORDANCE WITH nelac

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Benzyl alcohol	25.00	24.0	-4.1	30.00

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp70 Calibration: 5042804

Lab File ID: 5D27005-SCV170.d Standard ID: 5D27018

Sequence: 5D27005 Injection Date: 04/27/15

Lab Sample ID: 5D27005-SCV1 InjectionTime: 16:01

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Famphur	25.00	26.7	6.6	30.00
Kepone	25.00	23.8	-4.7	30.00

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp70 Calibration: 5042806

Lab File ID: 5D27014-SCV170.d Standard ID: 5D27022

Sequence: 5D27014 Injection Date: 04/27/15

Lab Sample ID: 5D27014-SCV1 InjectionTime: 21:14

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
p-Phenylenediamine	25.00	24.9	-0.5	30.00

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp62 Calibration: 5042807

Lab File ID: 5D27003-SCV162.d Standard ID: 5D27030

Sequence: 5D27003 Injection Date: 04/27/15

Lab Sample ID: 5D27003-SCV1 InjectionTime: 17:40

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Hexachlorophene	250.0	259	3.6	30.00

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp60 Calibration: 5042901

Lab File ID: 5D28001-SCV160.d Standard ID: 4L02038

Sequence: 5D28001 Injection Date: 04/28/15

Lab Sample ID: 5D28001-SCV1 InjectionTime: 16:44

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
2-Picoline	25.00	24.5	-2.1	30.00
N-Nitrosomethylethylamine	25.00	24.6	-1.6	30.00
Methyl Methanesulfonate	25.00	23.5	-5.9	30.00
N-Nitrosodiethylamine	25.00	24.1	-3.6	30.00
Ethyl Methanesulfonate	25.00	23.0	-7.9	30.00
N-Nitrosopyrrolidine	25.00	22.9	-8.4	30.00
N-Nitrosomorpholine	25.00	23.9	-4.5	30.00
o-Toluidine	25.00	23.5	-5.9	30.00
N-Nitrosopiperidine	25.00	23.7	-5.0	30.00
o,o,o-Triethyl phosphorothioate	25.00	26.7	6.8	30.00
2,6-Dichlorophenol	25.00	22.8	-8.7	30.00
Hexachloropropene	25.00	26.4	5.5	30.00
N-Nitroso-di-n-butylamine	25.00	24.8	-0.8	30.00
Safrole	25.00	23.7	-5.2	30.00
Isosafrole	25.00	24.7	-1.3	30.00
1,4-Naphthoquinone	25.00	27.0	8.2	30.00
Pentachlorobenzene	25.00	26.0	4.2	30.00
1-Naphthylamine	25.00	27.0	8.0	30.00
2-Naphthylamine	25.00	27.3	9.0	30.00
Zinophos	25.00	25.7	2.8	30.00
5-Nitro-o-toluidine	25.00	25.2	0.8	30.00

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp60 Calibration: 5042901

Lab File ID: 5D28001-SCV160.d Standard ID: 4L02038

Sequence: 5D28001 Injection Date: 04/28/15

Lab Sample ID: 5D28001-SCV1 InjectionTime: 16:44

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Sulfotep	25.00	27.9	11.4	30.00
1,3,5-Trinitrobenzene	25.00	23.0	-8.1	30.00
Phorate	25.00	27.0	8.0	30.00
Phenacetin	25.00	23.5	-6.0	30.00
Dimethoate	25.00	27.1	8.5	30.00
4-Aminobiphenyl	25.00	23.4	-6.3	30.00
Pentachloronitrobenzene	25.00	26.5	5.9	30.00
Pronamide	25.00	25.9	3.4	30.00
Disulfoton	25.00	27.2	8.8	30.00
Methyl Parathion	25.00	27.4	9.5	30.00
Parathion	25.00	26.2	4.9	30.00
4-Nitroquinoline-1-oxide	25.00	20.0	-20.0	30.00
Methapyrilene	25.00	22.3	-10.7	30.00
Isodrin	25.00	25.6	2.4	30.00
p-Dimethylaminoazobenzene	25.00	26.3	5.2	30.00
Chlorobenzilate	25.00	25.4	1.4	30.00
3,3'-Dimethylbenzidine	25.00	46.9	87.6 *	30.00
2-Acetylaminofluorene	25.00	25.3	1.3	30.00
7,12-Dimethylbenz(a)anthracene	25.00	25.2	0.7	30.00
3-Methylcholanthrene	25.00	23.9	-4.2	30.00
Diallate	25.00	26.8	7.1	30.00

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp60 Calibration: 5042901

Lab File ID: 5D28001-SCV160.d Standard ID: 4L02038

Sequence: 5D28001 Injection Date: 04/28/15

Lab Sample ID: 5D28001-SCV1 InjectionTime: 16:44

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
a,a-Dimethylphenethylamine	25.00	24.3	-2.9	30.00
Aramite	25.00	24.0	-3.8	30.00

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D ADD

Client:	DRAPER ADEN ASSOCIATES	SDG:	1504090
Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13		
Instrument ID:	5972hp62	Calibration:	5042807
Lab File ID:	5D28002-ICV162.d	Calibration Date:	04/27/15 11:36
Sequence:	5D28002	Injection Date:	04/28/15
Lab Sample ID:	5D28002-ICV1	Injection Time:	13:01

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
Hexachlorophene	Avg	1000	235	3.589074E-02	3.350455E-02	0.01	-6.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp66 Calibration: 5040707

Lab File ID: 5D28003-ICV1R66.d Calibration Date: 04/06/15 12:01

Sequence: 5D28003 Injection Date: 04/28/15

Lab Sample ID: 5D28003-ICV1 Injection Time: 14:02

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
N-Nitrosodimethylamine	Avg	25.00	25.0	1.132379	1.14322	0.05	1.0	20
Pyridine	Avg	25.00	25.5	1.481497	1.500992	0.05	1.3	20
Phenol	Avg	25.00	24.0	1.62311	1.543914	0.8	-4.9	20
Bis(2-chloroethyl)ether	Avg	25.00	23.5	1.357103	1.275274	0.7	-6.0	20
2-Chlorophenol	Avg	25.00	23.0	1.327375	1.230089	0.8	-7.3	20
2-Methylphenol	Avg	25.00	23.5	1.179539	1.100746	0.7	-6.7	20
2,2'-oxybis(1-Chloropropane)	Avg	25.00	26.0	2.133552	2.211199	0.01	3.6	20
3 & 4-Methylphenol	Avg	25.00	24.0	1.311322	1.253738	0.05	-4.4	20
N-Nitroso-di-N-propylamine	Avg	25.00	23.0	1.027424	0.9547176	0.5	-7.1	20
Acetophenone	Avg	25.00	22.0	0.4627723	0.4097783	0.01	-11.5	20
Hexachloroethane	Avg	25.00	25.0	0.7441483	0.7460865	0.3	0.3	20
Nitrobenzene	Avg	25.00	25.0	0.4019056	0.4047607	0.2	0.7	20
Isophorone	Avg	25.00	24.5	0.6942039	0.6781624	0.4	-2.3	20
2-Nitrophenol	Avg	25.00	24.0	0.1874994	0.1808933	0.1	-3.5	20
2,4-Dimethylphenol	Avg	25.00	24.0	0.2773766	0.2650847	0.2	-4.4	20
Bis(2-chloroethoxy)methane	Avg	25.00	24.0	0.4384692	0.4246997	0.3	-3.1	20
2,4-Dichlorophenol	Avg	25.00	24.5	0.3238572	0.3168284	0.2	-2.2	20
4-Chloroaniline	Avg	25.00	23.5	0.4703234	0.4397763	0.01	-6.5	20
4-Chloro-3-methylphenol	Avg	25.00	24.0	0.2945308	0.2832021	0.2	-3.8	20
2-Methylnaphthalene	Avg	25.00	24.5	0.5781478	0.5666425	0.4	-2.0	20
Hexachlorocyclopentadiene	Avg	25.00	24.0	0.4424167	0.4291973	0.05	-3.0	20
1,2,4,5-Tetrachlorobenzene	Avg	25.00	25.0	0.652097	0.6468645	0.01	-0.8	20
2,4,6-Trichlorophenol	Avg	25.00	25.0	0.3794274	0.3809941	0.2	0.4	20
2,4,5-Trichlorophenol	Avg	25.00	24.0	0.4356739	0.4172427	0.2	-4.2	20

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CONTINUING CALIBRATION CHECK

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp66 Calibration: 5040707

Lab File ID: 5D28003-ICV1R66.d Calibration Date: 04/06/15 12:01

Sequence: 5D28003 Injection Date: 04/28/15

Lab Sample ID: 5D28003-ICV1 Injection Time: 14:02

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
2-Chloronaphthalene	Avg	25.00	24.5	1.162133	1.141568	0.8	-1.8	20
2-Nitroaniline	Avg	25.00	24.0	0.4716201	0.45193	0.01	-4.2	20
Dimethylphthalate	Avg	25.00	23.5	1.41399	1.336538	0.01	-5.5	20
2,6-Dinitrotoluene	Avg	25.00	23.5	0.3109416	0.2905912	0.2	-6.5	20
Acenaphthylene	Avg	25.00	24.5	1.695497	1.669186	0.9	-1.6	20
3-Nitroaniline	Avg	25.00	22.5	0.3548881	0.3173751	0.01	-10.6	20
Acenaphthene	Avg	25.00	24.5	1.136998	1.123245	0.9	-1.2	20
2,4-Dinitrophenol	Q	25.00	24.5	0.1357974	0.1276781	0.01	-2.0	20
4-Nitrophenol	Q	25.00	24.0	0.278762	0.2693968	0.01	-4.0	20
2,4-Dinitrotoluene	Lin	25.00	21.0	0.409851	0.3593695	0.2	-16.0	20
Dibenzofuran	Avg	25.00	24.0	1.683629	1.616022	0.8	-4.0	20
2,3,4,6-Tetrachlorophenol	Avg	25.00	24.0	0.3802405	0.3641084	0.01	-4.2	20
Diethylphthalate	Avg	25.00	24.0	1.482332	1.429291	0.01	-3.6	20
4-Chlorophenyl-phenylether	Avg	25.00	24.0	0.6282192	0.6027841	0.4	-4.0	20
Fluorene	Avg	25.00	24.0	1.213175	1.167837	0.9	-3.7	20
4-Nitroaniline	Avg	25.00	23.0	0.3389786	0.3093901	0.01	-8.7	20
4,6-Dinitro-2-methylphenol	Q	25.00	26.0	0.114952	0.123143	0.01	4.0	20
N-Nitrosodiphenylamine (1)	Avg	25.00	25.5	0.5997953	0.6135666	0.01	2.3	20
4-Bromophenyl-phenylether	Avg	25.00	25.5	0.2272536	0.2338376	0.1	2.9	20
Hexachlorobenzene	Avg	25.00	26.0	0.3057823	0.3163181	0.1	3.4	20
Pentachlorophenol	Lin	25.00	25.0	0.1500984	0.1644751	0.05	0.0	20
Phenanthrene	Avg	25.00	25.5	1.074352	1.106206	0.7	3.0	20
Anthracene	Avg	25.00	25.0	1.04784	1.053791	0.7	0.6	20
Di-n-butylphthalate	Avg	25.00	24.0	1.402126	1.360756	0.01	-3.0	20

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CONTINUING CALIBRATION CHECK

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp66 Calibration: 5040707

Lab File ID: 5D28003-ICV1R66.d Calibration Date: 04/06/15 12:01

Sequence: 5D28003 Injection Date: 04/28/15

Lab Sample ID: 5D28003-ICV1 Injection Time: 14:02

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
Fluoranthene	Avg	25.00	24.5	1.156308	1.134234	0.6	-1.9	20
Pyrene	Avg	25.00	23.5	1.033895	0.9751	0.6	-5.7	20
Butylbenzylphthalate	Avg	25.00	23.0	0.5258338	0.4788608	0.01	-8.9	20
3,3'-Dichlorobenzidine	Avg	25.00	20.5	0.3857534	0.3182459	0.01	-17.5	20
bis(2-ethylhexyl)Phthalate	Avg	25.00	24.0	0.7322605	0.7103115	0.01	-3.0	20
Benzo (a) anthracene	Avg	25.00	24.0	0.9481395	0.9099479	0.8	-4.0	20
Chrysene	Avg	25.00	24.0	0.9003416	0.8586789	0.7	-4.6	20
Di-n-octylphthalate	Lin	25.00	22.0	1.665974	1.542631	0.01	-12.0	20
Benzo (b) fluoranthene	Avg	25.00	25.0	1.429663	1.431632	0.7	0.1	20
Benzo(k)fluoranthene	Avg	25.00	25.5	1.514101	1.533453	0.7	1.3	20
Benzo (a) pyrene	Avg	25.00	25.0	1.358925	1.358791	0.7	-0.01	20
Indeno(1,2,3-cd)pyrene	Avg	25.00	24.0	1.223993	1.1889	0.5	-2.9	20
Dibenzo(a,h)anthracene	Avg	25.00	26.0	1.315003	1.36663	0.4	3.9	20
Benzo (g,h,i) perylene	Avg	25.00	25.5	1.339888	1.364981	0.5	1.9	20
1,3-Dinitrobenzene	Lin	25.00	21.5	8.162971E-02	7.367362E-02	0.01	-14.0	20
Aniline	Avg	25.00	23.5	2.019354	1.897503	0.01	-6.0	20
Benzyl alcohol	Avg	25.00	23.5	0.825913	0.7725828	0.01	-6.5	20
2-Fluorophenol	Avg	25.00	24.50	1.177296	1.146125	0.05	-2.6	20
Phenol-d5	Avg	25.00	24.00	1.47508	1.405077	0.05	-4.7	20
Nitrobenzene-d5	Avg	25.00	24.50	0.3750073	0.3680123	0.05	-1.9	20
2-Fluorobiphenyl	Avg	25.00	24.50	1.282022	1.258354	0.05	-1.8	20
2,4,6-Tribromophenol	Avg	25.00	24.00	0.3169503	0.3039896	0.05	-4.1	20
Terphenyl-d14	Avg	25.00	23.50	0.731112	0.685858	0.05	-6.2	20

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CONTINUING CALIBRATION CHECK

SW8270D ADD

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp70 Calibration: 5042804

Lab File ID: 5D28004-ICV170.d Calibration Date: 04/27/15 11:20

Sequence: 5D28004 Injection Date: 04/28/15

Lab Sample ID: 5D28004-ICV1 Injection Time: 12:48

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
Famphur	Avg	25.00	24.0	0.4119553	0.3958838	0.05	-3.9	20
Kepone	Lin	25.00	26.5	7.534251E-02	8.538574E-02	0.05	6.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D ADD

Client:	DRAPER ADEN ASSOCIATES	SDG:	1504090
Project:	RAAP APPIX 2013 UNIT 16 & 10/B03204-13		
Instrument ID:	5972hp70	Calibration:	5042806
Lab File ID:	5D28005-ICV170.d	Calibration Date:	04/27/15 16:38
Sequence:	5D28005	Injection Date:	04/28/15
Lab Sample ID:	5D28005-ICV1	Injection Time:	13:30

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
p-Phenylenediamine	Avg	25.00	25.5	0.8127797	0.8228609	0.05	1.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp60 Calibration: 5042901

Lab File ID: 5D29001-ICV160.d Calibration Date: 04/28/15 11:26

Sequence: 5D29001 Injection Date: 04/29/15

Lab Sample ID: 5D29001-ICV1 Injection Time: 10:25

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
2-Picoline	Avg	25.00	24.5	1.520773	1.480184		-2.7	20
N-Nitrosomethylethylamine	Avg	25.00	24.5	0.7248392	0.7141161		-1.5	20
Methyl Methanesulfonate	Avg	25.00	26.0	0.977289	1.014796		3.8	20
N-Nitrosodiethylamine	Avg	25.00	25.5	0.6873658	0.7006941		1.9	20
Ethyl Methanesulfonate	Avg	25.00	26.5	1.478723	1.569153		6.1	20
N-Nitrosopyrrolidine	Avg	25.00	27.5	0.7970957	0.873954		9.6	20
N-Nitrosomorpholine	Avg	25.00	26.0	0.2749396	0.2835704		3.1	20
o-Toluidine	Avg	25.00	26.0	2.237974	2.326412		4.0	20
N-Nitrosopiperidine	Avg	25.00	24.0	0.1884916	0.1801369		-4.4	20
o,o,o-Triethyl phosphorothioate	Avg	25.00	22.0	0.1395251	0.1215455		-12.9	20
2,6-Dichlorophenol	Avg	25.00	25.0	0.2880985	0.2877779		-0.1	20
Hexachloropropene	Avg	25.00	24.0	0.2023764	0.1948155		-3.7	20
N-Nitroso-di-n-butylamine	Avg	25.00	25.0	0.2547865	0.2564357		0.6	20
Safrole	Avg	25.00	25.0	0.2361113	0.2375242		0.6	20
Isosafrole	Avg	25.00	23.5	7.563879E-02	7.165486E-02		-5.3	20
1,4-Naphthoquinone	Avg	25.00	25.5	0.4077832	0.4149449		1.8	20
Pentachlorobenzene	Avg	25.00	25.0	0.5693716	0.5697197		0.06	20
1-Naphthylamine	Avg	25.00	24.5	1.215918	1.185808		-2.5	20
2-Naphthylamine	Avg	25.00	25.0	1.238165	1.244413		0.5	20
Zinophos	Avg	25.00	24.5	0.3992493	0.389886		-2.3	20
5-Nitro-o-toluidine	Lin	25.00	22.0	0.3623902	0.3421907		-12.0	20
Sulfotep	Avg	25.00	26.5	0.1785214	0.1886288		5.7	20
1,3,5-Trinitrobenzene	Q	25.00	23.0	6.372832E-02	6.222553E-02		-8.0	20
Phorate	Avg	25.00	25.0	0.1479963	0.1479886		-0.005	20

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CONTINUING CALIBRATION CHECK

SW8270D APPIX

Client: DRAPER ADEN ASSOCIATES SDG: 1504090

Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp60 Calibration: 5042901

Lab File ID: 5D29001-ICV160.d Calibration Date: 04/28/15 11:26

Sequence: 5D29001 Injection Date: 04/29/15

Lab Sample ID: 5D29001-ICV1 Injection Time: 10:25

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
Phenacetin	Lin	25.00	23.0	0.413228	0.3982909		-8.0	20
Dimethoate	Avg	25.00	24.0	0.3548795	0.3387883		-4.5	20
4-Aminobiphenyl	Avg	25.00	24.5	0.7522539	0.7430359		-1.2	20
Pentachloronitrobenzene	Avg	25.00	24.5	8.598608E-02	8.508877E-02		-1.0	20
Pronamide	Avg	25.00	25.0	0.3472701	0.3490444		0.5	20
Disulfoton	Avg	25.00	25.5	0.4315531	0.4406105		2.1	20
Methyl Parathion	Avg	25.00	26.0	0.3000065	0.3103499		3.4	20
Parathion	Avg	25.00	24.5	0.1759866	0.1740323		-1.1	20
4-Nitroquinoline-1-oxide	Lin	25.00	21.0	9.394602E-02	8.685283E-02		-16.0	20
Methapyrilene	Avg	25.00	22.0	0.325877	0.2855771		-12.4	20
Isodrin	Avg	25.00	25.0	0.1399975	0.1404052		0.3	20
p-Dimethylaminoazobenzene	Avg	25.00	26.5	0.1848439	0.1971167		6.6	20
Chlorobenzilate	Avg	25.00	26.5	0.2824974	0.3014862		6.7	20
3,3'-Dimethylbenzidine	Lin	25.00	26.8	0.3054666	0.2608648		7.3	20
2-Acetylaminofluorene	Q	25.00	24.0	0.3836575	0.4077426		-4.0	20
7,12-Dimethylbenz(a)anthracene	Avg	25.00	26.0	0.6151904	0.6395572		4.0	20
3-Methylcholanthrene	Avg	25.00	25.5	0.6888684	0.7062042		2.5	20
Diallate	Avg	25.00	24.5	0.3635884	0.3569996		-1.8	20
a,a-Dimethylphenethylamine	Avg	25.00	25.5	1.086166	1.113562		2.5	20
Aramite	Q	25.00	24.5	6.062229E-02	6.582835E-02		-2.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

SW8270D

SBLKVJ

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042407-BLK166.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042407-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 14:41

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
62-75-9	N-Nitrosodimethylamine		0.98	5.0	U
110-86-1	Pyridine		1.1	5.0	U
108-95-2	Phenol		0.62	10	U
111-44-4	Bis(2-chloroethyl)ether		1.3	5.0	U
95-57-8	2-Chlorophenol		1.4	10	U
95-48-7	2-Methylphenol		2.2	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)		1.6	5.0	U
106-44-5	3 & 4-Methylphenol		1.7	10	U
621-64-7	N-Nitroso-di-N-propylamine		1.8	5.0	U
98-86-2	Acetophenone		1.2	5.0	U
67-72-1	Hexachloroethane		1.1	5.0	U
98-95-3	Nitrobenzene		1.3	5.0	U
78-59-1	Isophorone		0.94	5.0	U
88-75-5	2-Nitrophenol		0.99	10	U
105-67-9	2,4-Dimethylphenol		4.8	10	U
111-91-1	Bis(2-chloroethoxy)methane		0.99	5.0	U
120-83-2	2,4-Dichlorophenol		1.6	10	U
106-47-8	4-Chloroaniline		1.1	10	U
59-50-7	4-Chloro-3-methylphenol		0.82	10	U
91-57-6	2-Methylnaphthalene		1.1	5.0	U
77-47-4	Hexachlorocyclopentadiene		0.91	5.0	U
95-94-3	1,2,4,5-Tetrachlorobenzene		1.9	5.0	U
88-06-2	2,4,6-Trichlorophenol		0.89	10	U
95-95-4	2,4,5-Trichlorophenol		1.5	10	U
91-58-7	2-Chloronaphthalene		1.0	5.0	U
88-74-4	2-Nitroaniline		1.5	10	U
131-11-3	Dimethylphthalate		0.64	5.0	U
606-20-2	2,6-Dinitrotoluene		0.75	5.0	U
208-96-8	Acenaphthylene		0.96	5.0	U
99-09-2	3-Nitroaniline		0.83	10	U
83-32-9	Acenaphthene		0.80	5.0	U
51-28-5	2,4-Dinitrophenol		2.1	10	U
100-02-7	4-Nitrophenol		2.3	10	U
121-14-2	2,4-Dinitrotoluene		0.84	5.0	U

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

SBLKVJ

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042407-BLK166.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042407-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 14:41

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
132-64-9	Dibenzofuran		0.76	5.0	U
58-90-2	2,3,4,6-Tetrachlorophenol		0.70	10	U
84-66-2	Diethylphthalate		0.52	5.0	U
7005-72-3	4-Chlorophenyl-phenylether		0.66	5.0	U
86-73-7	Fluorene		0.71	5.0	U
100-01-6	4-Nitroaniline		2.7	10	U
534-52-1	4,6-Dinitro-2-methylphenol		1.1	10	U
86-30-6	N-Nitrosodiphenylamine (1)		0.97	5.0	U
101-55-3	4-Bromophenyl-phenylether		0.80	5.0	U
118-74-1	Hexachlorobenzene		0.57	5.0	U
87-86-5	Pentachlorophenol		2.6	10	U
85-01-8	Phenanthrene		0.70	5.0	U
120-12-7	Anthracene		0.77	5.0	U
84-74-2	Di-n-butylphthalate		0.74	5.0	U
206-44-0	Fluoranthene		0.58	5.0	U
129-00-0	Pyrene		0.73	5.0	U
85-68-7	Butylbenzylphthalate		0.55	5.0	U
91-94-1	3,3'-Dichlorobenzidine		1.4	5.0	U
117-81-7	bis(2-ethylhexyl)Phthalate		0.57	5.0	U
56-55-3	Benzo (a) anthracene		0.57	5.0	U
218-01-9	Chrysene		2.2	5.0	U
117-84-0	Di-n-octylphthalate		0.71	5.0	U
205-99-2	Benzo (b) fluoranthene		0.68	5.0	U
207-08-9	Benzo(k)fluoranthene		1.5	5.0	U
50-32-8	Benzo (a) pyrene		0.70	5.0	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.64	5.0	U
53-70-3	Dibenzo(a,h)anthracene		0.74	5.0	U
191-24-2	Benzo (g,h,i) perylene		0.61	5.0	U
99-65-0	1,3-Dinitrobenzene		1.1	5.0	U
62-53-3	Aniline		1.8	5.0	U
100-51-6	Benzyl alcohol		1.1	5.0	U

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	100.0	68.39	68	33 - 110	
Phenol-d5	100.0	41.45	41	20 - 110	

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ANALYSIS DATA SHEET

SW8270D

SBLKVJ

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042407-BLK166.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042407-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 14:41

Batch: 5042407 Sequence: 5D28003 Calibration: 5040707 Instrument: 5972hp66

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	46.46	93	45 - 110	
2-Fluorobiphenyl	50.00	42.74	85	46 - 110	
2,4,6-Tribromophenol	100.0	88.17	88	42 - 119	
Terphenyl-d14	50.00	49.55	99	59 - 110	

CAS NO.	TICS	CONC.(ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ANALYSIS DATA SHEET

SW8270D APPIX

SBLKVM

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042414-BLK160.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042414-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 11:14

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
109-06-8	2-Picoline		0.74	5.0	U
10595-95-6	N-Nitrosomethylethylamine		0.99	5.0	U
66-27-3	Methyl Methanesulfonate		0.78	5.0	U
55-18-5	N-Nitrosodiethylamine		0.78	5.0	U
62-50-0	Ethyl Methanesulfonate		1.1	5.0	U
930-55-2	N-Nitrosopyrrolidine		0.61	5.0	U
59-89-2	N-Nitrosomorpholine		0.85	5.0	U
95-53-4	o-Toluidine		0.46	5.0	U
100-75-4	N-Nitrosopiperidine		0.35	5.0	U
126-68-1	o,o,o-Triethyl phosphorothioate		0.57	5.0	U
87-65-0	2,6-Dichlorophenol		0.42	10	U
1888-71-7	Hexachloropropene		0.50	5.0	U
924-16-3	N-Nitroso-di-n-butylamine		0.57	5.0	U
94-59-7	Safrole		0.37	5.0	U
120-58-1	Isosafrole		0.47	5.0	U
130-15-4	1,4-Naphthoquinone		0.28	5.0	U
608-93-5	Pentachlorobenzene		0.75	5.0	U
134-32-7	1-Naphthylamine		0.59	5.0	U
91-59-8	2-Naphthylamine		0.45	5.0	U
297-97-2	Zinophos		0.75	5.0	U
99-55-8	5-Nitro-o-toluidine		0.37	5.0	U
3689-24-5	Sulfotep		0.52	5.0	U
99-35-4	1,3,5-Trinitrobenzene		0.42	5.0	U
298-02-2	Phorate		0.47	5.0	U
62-44-2	Phenacetin		0.38	5.0	U
60-51-5	Dimethoate		0.39	5.0	U
92-67-1	4-Aminobiphenyl		0.35	5.0	U
82-68-8	Pentachloronitrobenzene		0.44	5.0	U
23950-58-5	Pronamide		0.27	5.0	U
298-04-4	Disulfoton		0.45	5.0	U
298-00-0	Methyl Parathion		0.52	5.0	U
56-38-2	Parathion		0.43	5.0	U
56-57-5	4-Nitroquinoline-1-oxide		0.54	5.0	U
91-80-5	Methapyrilene		1.4	5.0	U

ANALYSIS DATA SHEET

SW8270D APPIX

SBLKVM

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042414-BLK160.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042414-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/29/15 11:14

Batch: 5042414 Sequence: 5D29001 Calibration: 5042901 Instrument: 5972hp60

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
465-73-6	Isodrin		0.52	5.0	U
60-11-7	p-Dimethylaminoazobenzene		0.47	5.0	U
510-15-6	Chlorobenzilate		0.34	5.0	U
119-93-7	3,3'-Dimethylbenzidine		1.4	5.0	U
53-96-3	2-Acetylaminofluorene		0.82	5.0	U
57-97-6	7,12-Dimethylbenz(a)anthracene		0.31	5.0	U
56-49-5	3-Methylcholanthrene		0.26	5.0	U
2303-16-4	Diallate		0.92	10	U
122-09-8	a,a-Dimethylphenethylamine		3.8	15	U
140-57-8	Aramite		0.84	5.0	U

CAS NO.	TICS	CONC.(ug/L)	Response	R.T.	% Match	Q

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ANALYSIS DATA SHEET

SW8270D ADD

SBLKVN

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042415-BLK162.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042415-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 13:46

Batch: 5042415 Sequence: 5D28002 Calibration: 5042807 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
70-30-4	Hexachlorophene		40	100	U

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D ADD

SBLKVO

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042416-BLK170.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042416-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 14:11

Batch: 5042416 Sequence: 5D28004 Calibration: 5042804 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
52-85-7	Famphur		0.59	5.0	U
143-50-0	Kepone		0.54	5.0	U

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

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ANALYSIS DATA SHEET

SW8270D ADD

SBLKVP

Client: DRAPER ADEN ASSOCIATES SDG: 1504090 Project: RAAP APPIX 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042417-BLK170.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042417-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/28/15 09:24

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 14:11

Batch: 5042417 Sequence: 5D28005 Calibration: 5042806 Instrument: 5972hp70

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
106-50-3	p-Phenylenediamine		1.5	10	U

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

Patterson
Assigned To

2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

H: 4/29
D: 5/13

5042407

SVOC 8270D

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-28-15 @ 0924

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH A/N	Adjusted pH BASE	QC	Surr (uL)	Comments
1504090-01	16WC1A	Sample	1000	1000	1.9	13	QC	500	Extract MS, MSD @ 500 ml
1504090-02	16C1	Sample	1000	1000	1.6	13	N/A	500	
1504090-03	16MW8	Sample	1000	1000	1.6	13		500	
1504090-04	16MW9	Sample	1000	1000	1.9	13		500	
1504090-05	16WDUP	Sample	1000	1000	1.6	13		500	
1504090-06	16WC1B	Sample	1000	1000	1.6	13		500	
5042407-BLK1	SBLKVJ	Blank	1000	1000	1.6	13		500	
5042407-BS1	SLCSVJ	LCS	1000	1000	1.6	12		500	
5042407-MS1	16WC1AMS	Matrix Spike	500	500	1.9	13		250	
5042407-MSD1	16WC1AMSD	Matrix Spike Dup	500	500	1.9	13		250	

4-28-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	250		SD27002
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		SD27002
SPIKE	8270 Full Short LCS/MS Spike 2	250	MS/MSD	SC03006
SPIKE	8270 Full Short LCS/MS Spike 2	500	LCS/LCSD	SC03006
SPIKE	8270 Full Short LCS/MS Spike 1	250	MS/MSD	SC30005
SPIKE	8270 Full Short LCS/MS Spike 1	500	LCS/LCSD	SC30005

Surrogate & Spike Added By: BFP 4-28-15
Initials / Date

Spiking Witnessed By: CH 4-28-15
Initials / Date

Analysts Initials: Extracted: BFP, CH KD: BFP N2: BFP, CH Bottled up: CH

Final Vol Verified: CHaley

Reviewed By: BPatterson

Assoc. Batches 5042414
5042415
5042416
5042417

Manuf. and lot # of reagents/solvents used: Na_2SO_4-SD03003, CH_2Cl_2-SD20002, H_2SO_4-4F27003, 10N NaOH - SC31014

B Patterson
Assigned To

2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

5042414

SVOC 8270D APPIX

H: 4/29
D: 5/13

Date/Time Extracted: 4-28-15@ 0924

Prepared using: SVOA - EPA 3510C_SVOA

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH		QC	Surr (uL)	Comments
					A/N	BASE			
1504090-01	16WC1A	Sample	1000	1000	1.9	13	QC	500	Extract MS, MSD @ 500 ml
1504090-02	16C1	Sample	1000	1000	1.6	13	N/A	500	
1504090-03	16MW8	Sample	1000	1000	1.6	13		500	
1504090-04	16MW9	Sample	1000	1000	1.9	13		500	
1504090-05	16WDUP	Sample	1000	1000	1.6	13		500	
1504090-06	16WC1B	Sample	1000	1000	1.6	13		500	
5042414-BLK1	SBLKVM	Blank	1000	BFP 1/6 1000	1.6	13		500	
5042414-BS1	SLCSVM	LCS	1000	4-28-15 BFP 1000	1.6	13		500	
5042414-MS1	16WC1AMS	Matrix Spike	500	500	1.9	13		250	
5042414-MSD1	16WC1AMSD	Matrix Spike Dup	500	500	1.9	13	NA	250	

4-28-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	250		SD27002
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		SD27002
SPIKE	8270 Full APP IX LCS/MS Spike	250	MS/MSD	4L10003
SPIKE	8270 Full APP IX LCS/MS Spike	500	LCS/LCSD	4L10003

Surrogate & Spike Added By: BFP 4-28-15
Initials / Date

Spiking Witnessed By: CH 4-28-15
Initials / Date

Final Vol Verified: CH

Reviewed By: B Patterson

Analysts Initials: Extracted: BFP, CH KD: BFP N2: BFP, CH Bottled up: CH

Use Blank 5042407 & Sample extractions

Assoc. Batches 5042407
5042415
5042416
5042417

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - SD03003, CH_2Cl_2 - SD20002, H_2SO_4 - 4F27003, 10N NaOH - SC31014

B Patterson
Assigned To

2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

H: 4/29
D: 5/13

5042415

SVOC 8270D Hexachlorphene-Addnl

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-28-15@ 0924

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH A/N	Adjusted pH BASE	QC	Surr (uL)	Comments
1504090-01	16WC1A	Sample	1000	1000	1.9	13	QC	500	
1504090-02	16C1	Sample	1000	1000	1.6	13	NA	500	
1504090-03	16MW8	Sample	1000	1000	1.6	13		500	
1504090-04	16MW9	Sample	1000	1000	1.9	13		500	
1504090-05	16WDUP	Sample	1000	1000	1.6	13		500	
1504090-06	16WC1B	Sample	1000	1000	1.6	13		500	
5042415-BLK1	SBLKVN	Blank	1000	1.6 1000	1.6	13		500	
5042415-BS1	SLCSVN	LCS	1000	1.6 1000	1.6	13	↓	500	
5042415-BSD1	SLCSDVN	LCS Dup	1000	1.6 1000	1.6	13	NA	500	

4-28-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		5D27002
SPIKE	8270 Full Hexachlorophene LCS/MS	500	LCS/LCSD	5A14021

Surrogate & Spike Added By: BFP 4-28-15
Initials / Date

Spiking Witnessed By: CH 4-28-15
Initials / Date

Final Vol Verified:

Reviewed By:

Analysts Initials: Extracted: BFP, CH KD: BFP N2: BFP, CH Bottled up: CH

Use Blank 5042407 & Sample extractions

Assoc. Batches 5042407
5042414
5042416
5042417

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - SD03003, CH_2Cl_2 - SD20002, H_2SO_4 - 4F27003, 10N NaOH - SC31014

B Patterson
Assigned To

2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

BFP 4-24-15
H: ~~4/24~~ 4/29
D: 5/13

5042416

SVOC 8270D Kepone & Famphur-ADDNL

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-29-15@0924

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH A/N	Adjusted pH BASE	QC	Surr (uL)	Comments
1504090-01	16WC1A	Sample	1000	1000	1.9	13	QC	500	
1504090-02	16C1	Sample	1000	1000	1.6	13	NA	500	
1504090-03	16MW8	Sample	1000	1000	1.6	13		500	
1504090-04	16MW9	Sample	1000	1000	1.9	13		500	
1504090-05	16WDUP	Sample	1000	1000	1.6	13		500	
1504090-06	16WC1B	Sample	1000	1000	1.6	13		500	
5042416-BLK1	SBLKVO	Blank	1000	1000	1.6	13		500	
5042416-BS1	SLCSVO	LCS	1000	1000	1.6	13		500	
5042416-BSD1	SLCSDVO	LCS Dup	1000	1000	1.6	13	NA	500	

4-29-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		SD27002
SPIKE	8270 Full Kepone/Famphur LCS/MS	500	LCS/LCSD	SD18017

Surrogate & Spike Added By: BFP 4-22-15
Initials / Date

Spiking Witnessed By: CH 4-28-15
Initials / Date

Final Vol Verified: CH

Reviewed By:

Analysts Initials: Extracted: BFP, CH KD: BFP N2: BFP, CH Bottled up: CH

Use Blank 5042407 + Sample extractions

Assoc. Batches 5042407
5042414
5042415
5042417

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - SD03003, CH_2Cl_2 - SD20002, H_2SO_4 - 4F27003, 10N NaOH - SC31014

B Patterson
Assigned To

2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

H: 4/29
D: 5/13

5042417

SVOC 8270D p-phenylenediamine-ADDNL

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-28-15@0924

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH A/N	Adjusted pH BASE	QC	Surr (uL)	Comments
1504090-01	16WC1A	Sample	1000	1000	1.9	13	QC	500	
1504090-02	16C1	Sample	1000	1000	1.6	13	N/A	500	
1504090-03	16MW8	Sample	1000	1000	1.6	13		500	
1504090-04	16MW9	Sample	1000	1000	1.9	13		500	
1504090-05	16WDUP	Sample	1000	1000	1.6	13		500	
1504090-06	16WC1B	Sample	1000	1000	1.6	13		500	
5042417-BLK1	SBLKVP	Blank	1000	1000	1.6	13		500	
5042417-BS1	SLCSVP	LCS	1000	1000	1.6	13		500	
5042417-BSD1	SLCSDVP	LCS Dup	1000	1000	1.6	13	N/A	500	

4-28-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		SD27002
SPIKE	8270 Full p-Phenylenediamine LCS/M	500	LCS/LCSD	SD10030

Surrogate & Spike Added By: BFP 4-28-15
Initials / Date

Spiking Witnessed By: CH 4-28-15
Initials / Date

Final Vol Verified: CH

Reviewed By:

Analysts Initials: Extracted: BFP, CH KD: BFP N2: BFP, CH Bottled up: CH

Use Blank 5042407 + Sample extractions

Assoc. Batches 5042407
5042414
5042415
5042416

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - SD03003, CH_2Cl_2 - SD20002, H_2SO_4 - 4F27003, 10N NaOH - SC31014

CompuChem
A Division Of
Liberty Analytical Corp.

4/30/2015

Abridged data package.
Full deliverable available upon request.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2013 UNIT 16 & 10/B03204-13

WorkOrder: 1504091

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13 **Sdg:** 1504091

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1504091-01	16-2	Water	04/21/2015 12:00	04/23/2015 14:10
1504091-02	16-3	Water	04/21/2015 13:00	04/23/2015 14:10
1504091-03	16-5	Water	04/21/2015 14:10	04/23/2015 14:10
1504091-04	16WC2B	Water	04/22/2015 09:15	04/23/2015 14:10
1504091-05	16SPRING	Water	04/21/2015 14:30	04/23/2015 14:10

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Laboratory: COMPUCHEM

SDG: 1504091

Client Sample Id:	Analysis:	Lab Sample Id:
16-2	SW8270D	1504091-01
16-3	SW8270D	1504091-02
16-5	SW8270D	1504091-03
16WC2B	SW8270D	1504091-04
16SPRING	SW8270D	1504091-05

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Quentisha Forrester

Name: Quentisha Forrester

Date: 04/28/2015

Title: Chemist III

Environmental Testing Laboratories
CompuChem
A Division Of
Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem

A division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # 1504091
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 16-2 16-3 16-5 16WC2B 16SPRING

The 5 aqueous samples listed above were received intact, temperatures ranging from -0.4°C to 0.7°C, with proper documentation, in sealed shipping containers, on April 23, 2015. These samples were scheduled for the requested analyses of the semivolatile fraction only. SW-846, 3rd Edition, Update 3, Separatory Funnel extraction (Method 3510C), and Method 8270D were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the narrative deals with the semivolatile fraction.

Semivolatile

Extraction and analysis holding time requirements were met for these samples.

No Semivolatile project analytes identified were confirmed above the Quantitation Limit (QL) in these samples.

Manual integrations were performed in this SDG, as indicated on the detailed Manual Integration Summary report that is located in section S. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG.

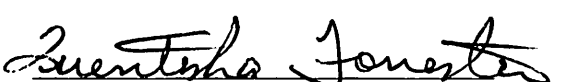
All of the surrogates met recovery and retention time criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria.

Duplicate matrix spikes were not requested with this SDG. Laboratory Control Samples (LCS/LCSD) were prepared and analyzed along with these samples and met all accuracy and precision criteria.

An uncertainty of these test results may be estimated from the recovery of the surrogates added to the sample prior to sample preparation or from the recovery of spiked compound(s) in the associated laboratory control sample. Further information is available upon request.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Furthermore, I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.



Quentisha Forrester
Chemist III
April 28, 2015

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

RUSH 4/16/15

Client: 0	**Consultant:**	Draper Aden Associates	**Sample Site:**	RFAAP, Radford, Virginia	**Project Specific (PS) or Batch (B) QC:**
Attn: 0	**Attn:**	Jenet C. Frazier			**Sample Collection for Project Complete?** YES
Address: 0	**Address:**	2206 South Main Street	**Location:**	HWMU16	
0		Blacksburg, Virginia 24060			**Carrier:** DASH COURIER
Phone: 0	**Phone:**	(540) 552-0444	**Event:**	2Q 2015 Annual Groundwater Monitoring Event	**Tracking Number:**
Fax: 0	**Fax:**	(540) 552-0291	**OAA JN:**	B03204-13	
Fax: 0			**Lab JN:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G		G	G				
Box 3 - Filtered/Unfiltered					U	U		U	U				
Required pH of Sample					<2	<2			>12				
Box 2 - Preservative					B	B		H	E				
Box 5 - Sample Container Type					1-500 ml P			2-1L AG	1-500-P				
Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	ICP/MS 6020A/3005A (Metals-Total)	7470A (Mercury-Total)		8270D/3510C (Semivolatiles)	9012B/9010C(Cyanide)	metals pH	cyanide pH		
16C1	4/22	1510	GW	4	X	X		X	X	<2	>12	1504090-02	
16MW8		1015	GW	4	X	X		X	X	<2	>12	-03	
16MW9		1130	GW	4	X	X		X	X	<2	>12	-04	
16WC1A		1345	GW	10 12	X	X		X	X	<2	>12	-01	(1) 500mL P container USE FOR QC for ms/msd/matrix spiked
16WDUP		1355	GW	4	X	X		X	X	<2	>12	-05	
16WC1B		1240	GW	4	X	X		X	X	<2	>12	-06	
16-2	4/21	1200	GW	3	X	X		X		<2		1504091-01	
16-3	4/21	1300	GW	3	X	X		X		<2		-02	
16-5	4/21	1410	GW	3	X	X		X		<2		-03	
16WC2B	4/22	0915	GW	3	X	X		X		<2		-04	
16SPRING	4/21	1430	GW	3	X	X		X		<2		-05	

GENERAL NOTES:
1. Report results to detection limit, with J flags, for italicized wells.
2. Report results at or greater than QL for non-italicized wells.
3. ERIS Deliverable required.
4. VELAP accreditation required.
5. Full deliverable.

Clients Special Instructions: Level 4 with edd. See attached target analyte list. 0.1°C, 0.7°C, -0.4°C, -0.1°C, 0.2°C, 0.1°C CN 16WC1B in (5) coolers @

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival ✓ Received on ice ✓ Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 4/21/15	#1 Relinquished by (Signature):	Date: 4/23/15	#2 Relinquished by (Signature): TAYLOR	Date: 4/23/15	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1035	Company Name: DASH COURIER	Time: 1410	
Sampler Name (Print): Tyler Emery	Date: 4/21/15	#1 Received by (Signature): TAYLOR	Date: 4/23/15	#2 Received by (Signature):	Date: 4/23/15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0800	Company Name: DASH	Time: 10:35	Company Name: CompuChem	Time: 1410	

1/8 JVR 4/17

HOLDING TIME SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
16-2	04/21/15	04/23/15	04/27/15	6	7	04/28/15	0.6	40	
16-3	04/21/15	04/23/15	04/27/15	6	7	04/28/15	0.6	40	
16-5	04/21/15	04/23/15	04/27/15	6	7	04/28/15	0.7	40	
16WC2B	04/22/15	04/23/15	04/27/15	5	7	04/28/15	0.7	40	
16SPRING	04/21/15	04/23/15	04/27/15	6	7	04/28/15	0.7	40	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

SDG: 1504091 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
Blank (5042401-BLK1) ug/L Lab File ID: 5042401-BLK166.d Analyzed: 04/27/15 18:00				
Nitrobenzene-d5	50.00	91	45 - 110	
2-Fluorobiphenyl	50.00	83	46 - 110	
Terphenyl-d14	50.00	92	59 - 110	
LCS (5042401-BS1) ug/L Lab File ID: 5042401-BS166.d Analyzed: 04/27/15 18:40				
Nitrobenzene-d5	50.00	97	45 - 110	
2-Fluorobiphenyl	50.00	88	46 - 110	
Terphenyl-d14	50.00	92	59 - 110	
LCS Dup (5042401-BSD1) ug/L Lab File ID: 5042401-BSD166.d Analyzed: 04/27/15 19:19				
Nitrobenzene-d5	50.00	92	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
Terphenyl-d14	50.00	93	59 - 110	
16-2 (1504091-01) ug/L Lab File ID: 1504091-0166.d Analyzed: 04/28/15 01:15				
Nitrobenzene-d5	50.00	87	45 - 110	
2-Fluorobiphenyl	50.00	79	46 - 110	
Terphenyl-d14	50.00	93	59 - 110	
16-3 (1504091-02) ug/L Lab File ID: 1504091-0266.d Analyzed: 04/28/15 01:54				
Nitrobenzene-d5	50.00	81	45 - 110	
2-Fluorobiphenyl	50.00	80	46 - 110	
Terphenyl-d14	50.00	97	59 - 110	
16-5 (1504091-03) ug/L Lab File ID: 1504091-0366.d Analyzed: 04/28/15 02:34				
Nitrobenzene-d5	50.00	93	45 - 110	
2-Fluorobiphenyl	50.00	81	46 - 110	
Terphenyl-d14	50.00	95	59 - 110	

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SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013 UNIT 16 & 10/B03204-13

SDG: 1504091 Instrument: 5972hp66

Sequence: 5D27004 Calibration: 5040707

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
16WC2B (1504091-04) ug/L Lab File ID: 1504091-0466.d Analyzed: 04/28/15 03:13				
Nitrobenzene-d5	50.00	83	45 - 110	
2-Fluorobiphenyl	50.00	75	46 - 110	
Terphenyl-d14	50.00	95	59 - 110	
16SPRING (1504091-05) ug/L Lab File ID: 1504091-0566.d Analyzed: 04/28/15 03:52				
Nitrobenzene-d5	50.00	86	45 - 110	
2-Fluorobiphenyl	50.00	78	46 - 110	
Terphenyl-d14	50.00	95	59 - 110	

LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042401-BS1 Matrix: Water Client ID: SLCSVI Batch: 5042401

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
2,6-Dinitrotoluene	40.00	38.9	97		66 - 117
2,4-Dinitrotoluene	40.00	37.7	94		58 - 123
Diethylphthalate	40.00	37.7	94		64 - 114

LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Lab ID: 5042401-BSD1 Matrix: Water Client ID: SLCSDVI Batch: 5042401

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS		
					RPD	Q	REC.
2,6-Dinitrotoluene	40.00	39.4	98	1	30		66 - 117
2,4-Dinitrotoluene	40.00	38.3	96	1	30		58 - 123
Diethylphthalate	40.00	38.0	95	0.9	30		64 - 114

PREPARATION BATCH SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Batch: 5042401 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16-2	1504091-01	04/27/15 10:23	1000	1000
16-3	1504091-02	04/27/15 10:23	1000	1000
16-5	1504091-03	04/27/15 10:23	1000	1000
16WC2B	1504091-04	04/27/15 10:23	1000	1000
16SPRING	1504091-05	04/27/15 10:23	1000	1000
SBLKVI	5042401-BLK1	04/27/15 10:23	1000	1000
SLCSVI	5042401-BS1	04/27/15 10:23	1000	1000
SLCSDVI	5042401-BSD1	04/27/15 10:23	1000	1000

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D06001 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCS	5D06001-TUN1	5D06001-TUN166.d	04/06/15 12:01:00
SSTD060CS	5D06001-CAL6	5D06001-CAL666.d	04/06/15 12:22:00
SSTD050CS	5D06001-CAL5	5D06001-CAL566.d	04/06/15 13:02:00
SSTD040CS	5D06001-CAL4	5D06001-CAL466.d	04/06/15 13:41:00
SSTD025CS	5D06001-CAL3	5D06001-CAL366.d	04/06/15 14:21:00
SSTD010CS	5D06001-CAL2	5D06001-CAL266.d	04/06/15 15:00:00
SSTD005CS	5D06001-CAL1	5D06001-CAL166.d	04/06/15 15:39:00
SCV025VAL1CS	5D06001-SCV1	5D06001-SCV166.d	04/06/15 16:20:00

ANALYSIS SEQUENCE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
DFTPPCY	5D27004-TUN1	5D27004-TUN166.d	04/27/15 16:59:00
SSTD025CY	5D27004-ICV1	5D27004-ICV166.d	04/27/15 17:21:00
SBLKVI	5042401-BLK1	5042401-BLK166.d	04/27/15 18:00:00
SLCSVI	5042401-BS1	5042401-BS166.d	04/27/15 18:40:00
SLCSDVI	5042401-BSD1	5042401-BSD166.d	04/27/15 19:19:00
16-2	1504091-01	1504091-0166.d	04/28/15 01:15:00
16-3	1504091-02	1504091-0266.d	04/28/15 01:54:00
16-5	1504091-03	1504091-0366.d	04/28/15 02:34:00
16WC2B	1504091-04	1504091-0466.d	04/28/15 03:13:00
16SPRING	1504091-05	1504091-0566.d	04/28/15 03:52:00

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504091
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D06001-TUN166.d	Injection Date:	04/06/15
Instrument ID:	5972hp66	Injection Time:	12:01
Sequence:	5D06001	Lab Sample ID:	5D06001-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	47.2	PASS
68	Less than 2% of 69	0	PASS
69	Present	60.5	PASS
70	Less than 2% of 69	0.0249	PASS
127	10 - 80% of 198	46.3	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.41	PASS
275	10 - 60% of 198	20.1	PASS
365	Greater than 1% of 198	2.59	PASS
441	Less than 100% of 443	79.4	PASS
442	50 - 100% of 198	68.3	PASS
443	15 - 24% of 442	19.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270D

Laboratory:	COMPUCHEM	SDG:	1504091
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP 2013 UNIT 16 & 10/B03204-13
Lab File ID:	5D27004-TUN166.d	Injection Date:	04/27/15
Instrument ID:	5972hp66	Injection Time:	16:59
Sequence:	5D27004	Lab Sample ID:	5D27004-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
198	Base peak, 100% relative abundance	100	PASS
51	10 - 80% of 198	46.6	PASS
68	Less than 2% of 69	0	PASS
69	Present	58.8	PASS
70	Less than 2% of 69	0.18	PASS
127	10 - 80% of 198	44.4	PASS
197	Less than 2% of 198	0	PASS
199	5 - 9% of 198	6.91	PASS
275	10 - 60% of 198	20.4	PASS
365	Greater than 1% of 198	2.9	PASS
441	Less than 100% of 443	83.1	PASS
442	50 - 100% of 198	75.3	PASS
443	15 - 24% of 442	18.8	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory:	COMPUCHEM	SDG:	1504091
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP 2013 UNIT 16 & 10/B03204-13
Sequence:	5D06001	Instrument:	5972hp66
		Calibration:	5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (5D06001-SCV1)			Lab File ID: 5D06001-SCV166.d		Analyzed: 04/06/15 16:20				
1,4-Dichlorobenzene-d4	148982	7.786	143668	7.788	104	50 - 200	-0.0020	+/-0.50	
Naphthalene-d8	535830	10.617	541824	10.619	99	50 - 200	-0.0020	+/-0.50	
Acenaphthene-d10	306223	14.675	329077	14.677	93	50 - 200	-0.0020	+/-0.50	
Phenanthrene-d10	555068	17.516	592711	17.518	94	50 - 200	-0.0020	+/-0.50	
Chrysene-d12	654684	21.87	707222	21.872	93	50 - 200	-0.0020	+/-0.50	
Perylene-d12	464008	23.965	500476	23.957	93	50 - 200	0.0080	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504091
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2013 UNIT 16 & 10/B03204-13
Sequence: 5D27004
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (5D27004-ICV1)			Lab File ID: 5D27004-ICV166.d			Analyzed: 04/27/15 17:21			
1,4-Dichlorobenzene-d4	157876	7.745	143668	7.788	110	50 - 200	-0.0430	+/-0.50	
Naphthalene-d8	524949	10.576	541824	10.619	97	50 - 200	-0.0430	+/-0.50	
Acenaphthene-d10	287803	14.634	329077	14.677	87	50 - 200	-0.0430	+/-0.50	
Phenanthrene-d10	521912	17.475	592711	17.518	88	50 - 200	-0.0430	+/-0.50	
Chrysene-d12	591195	21.829	707222	21.872	84	50 - 200	-0.0430	+/-0.50	
Perylene-d12	430117	23.914	500476	23.957	86	50 - 200	-0.0430	+/-0.50	
Blank (5042401-BLK1)			Lab File ID: 5042401-BLK166.d			Analyzed: 04/27/15 18:00			
1,4-Dichlorobenzene-d4	208577	7.75	157876	7.745	132	50 - 200	0.0050	+/-0.50	
Naphthalene-d8	821622	10.581	524949	10.576	157	50 - 200	0.0050	+/-0.50	
Acenaphthene-d10	480273	14.629	287803	14.634	167	50 - 200	-0.0050	+/-0.50	
Phenanthrene-d10	820635	17.48	521912	17.475	157	50 - 200	0.0050	+/-0.50	
Chrysene-d12	919282	21.824	591195	21.829	155	50 - 200	-0.0050	+/-0.50	
Perylene-d12	609019	23.919	430117	23.914	142	50 - 200	0.0050	+/-0.50	
LCS (5042401-BS1)			Lab File ID: 5042401-BS166.d			Analyzed: 04/27/15 18:40			
1,4-Dichlorobenzene-d4	145274	7.755	157876	7.745	92	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	524301	10.586	524949	10.576	100	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	280464	14.634	287803	14.634	97	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	498037	17.485	521912	17.475	95	50 - 200	0.0100	+/-0.50	
Chrysene-d12	554013	21.829	591195	21.829	94	50 - 200	0.0000	+/-0.50	
Perylene-d12	398711	23.914	430117	23.914	93	50 - 200	0.0000	+/-0.50	
LCS Dup (5042401-BSD1)			Lab File ID: 5042401-BSD166.d			Analyzed: 04/27/15 19:19			
1,4-Dichlorobenzene-d4	208045	7.754	157876	7.745	132	50 - 200	0.0090	+/-0.50	
Naphthalene-d8	787236	10.585	524949	10.576	150	50 - 200	0.0090	+/-0.50	
Acenaphthene-d10	433691	14.643	287803	14.634	151	50 - 200	0.0090	+/-0.50	
Phenanthrene-d10	771086	17.484	521912	17.475	148	50 - 200	0.0090	+/-0.50	
Chrysene-d12	854162	21.828	591195	21.829	144	50 - 200	-0.0010	+/-0.50	
Perylene-d12	635669	23.913	430117	23.914	148	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory: COMPUCHEM
SDG: 1504091
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2013 UNIT 16 & 10/B03204-13
Sequence: 5D27004
Instrument: 5972hp66
Calibration: 5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
16-2 (1504091-01)			Lab File ID: 1504091-0166.d			Analyzed: 04/28/15 01:15			
1,4-Dichlorobenzene-d4	149776	7.738	157876	7.745	95	50 - 200	-0.0070	+/-0.50	
Naphthalene-d8	571855	10.57	524949	10.576	109	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	325201	14.627	287803	14.634	113	50 - 200	-0.0070	+/-0.50	
Phenanthrene-d10	552976	17.469	521912	17.475	106	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	618582	21.823	591195	21.829	105	50 - 200	-0.0060	+/-0.50	
Perylene-d12	418342	23.908	430117	23.914	97	50 - 200	-0.0060	+/-0.50	
16-3 (1504091-02)			Lab File ID: 1504091-0266.d			Analyzed: 04/28/15 01:54			
1,4-Dichlorobenzene-d4	162521	7.734	157876	7.745	103	50 - 200	-0.0110	+/-0.50	
Naphthalene-d8	630087	10.565	524949	10.576	120	50 - 200	-0.0110	+/-0.50	
Acenaphthene-d10	364820	14.622	287803	14.634	127	50 - 200	-0.0120	+/-0.50	
Phenanthrene-d10	618317	17.474	521912	17.475	118	50 - 200	-0.0010	+/-0.50	
Chrysene-d12	680156	21.818	591195	21.829	115	50 - 200	-0.0110	+/-0.50	
Perylene-d12	431030	23.913	430117	23.914	100	50 - 200	-0.0010	+/-0.50	
16-5 (1504091-03)			Lab File ID: 1504091-0366.d			Analyzed: 04/28/15 02:34			
1,4-Dichlorobenzene-d4	130146	7.739	157876	7.745	82	50 - 200	-0.0060	+/-0.50	
Naphthalene-d8	480623	10.56	524949	10.576	92	50 - 200	-0.0160	+/-0.50	
Acenaphthene-d10	289822	14.628	287803	14.634	101	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	498405	17.469	521912	17.475	95	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	572388	21.823	591195	21.829	97	50 - 200	-0.0060	+/-0.50	
Perylene-d12	366791	23.908	430117	23.914	85	50 - 200	-0.0060	+/-0.50	
16WC2B (1504091-04)			Lab File ID: 1504091-0466.d			Analyzed: 04/28/15 03:13			
1,4-Dichlorobenzene-d4	169479	7.738	157876	7.745	107	50 - 200	-0.0070	+/-0.50	
Naphthalene-d8	629644	10.559	524949	10.576	120	50 - 200	-0.0170	+/-0.50	
Acenaphthene-d10	361706	14.627	287803	14.634	126	50 - 200	-0.0070	+/-0.50	
Phenanthrene-d10	603423	17.468	521912	17.475	116	50 - 200	-0.0070	+/-0.50	
Chrysene-d12	669266	21.822	591195	21.829	113	50 - 200	-0.0070	+/-0.50	
Perylene-d12	435225	23.907	430117	23.914	101	50 - 200	-0.0070	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270D

Laboratory:	COMPUCHEM	SDG:	1504091
Client:	DRAPER ADEN ASSOCIATES	Project:	RAAP 2013 UNIT 16 & 10/B03204-13
Sequence:	5D27004	Instrument:	5972hp66
		Calibration:	5040707

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
16SPRING (1504091-05)			Lab File ID: 1504091-0566.d			Analyzed: 04/28/15 03:52			
1,4-Dichlorobenzene-d4	154502	7.733	157876	7.745	98	50 - 200	-0.0120	+/-0.50	
Naphthalene-d8	579441	10.564	524949	10.576	110	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	326696	14.622	287803	14.634	114	50 - 200	-0.0120	+/-0.50	
Phenanthrene-d10	564015	17.473	521912	17.475	108	50 - 200	-0.0020	+/-0.50	
Chrysene-d12	623646	21.817	591195	21.829	105	50 - 200	-0.0120	+/-0.50	
Perylene-d12	391810	23.912	430117	23.914	91	50 - 200	-0.0020	+/-0.50	

K. Target Compound Results

(ANALYSIS DATA SHEETS)

Analysis Data Sheets (ADS), Tentatively Identified Compounds (TICs), and Surrogate Recovery Results

Sample data shall be arranged in packets with the Analysis Data Sheet, followed by the raw data for volatile or semivolatile samples. These sample packets shall be placed in increasing Client Sample ID number order, considering both letters and numbers.

a. Target Analyte Results (ANALYSIS DATA SHEET)

Tabulated results (identification and quantitation) and Tentatively Identified Compounds (TICs) shall be included.

b. Reconstructed Ion Chromatograms (RICs)

Include for each sample or sample extract, including dilutions and reanalyses. The RIC shall contain the following header information: Client Sample ID Number, date and time of analysis, instrument ID, Lab file ID, and analyst ID.

d. Quantitation Report for target analytes and TICs.

Include a printout of the Extracted Ion Current Profile (EICP) for all manual changes to all compounds, internal standards, and surrogate compounds.

e. Copies of raw spectra and copies of background-subtracted mass spectra of target analytes plus TICs identified in the sample.

- The spectra shall include the following information: Client Sample ID number, Lab file ID, date and time of analysis, and instrument ID.
- The compound name must be clearly marked.

ANALYSIS DATA SHEET

SW8270D

16-2

Client: DRAPER ADEN ASSOCIATES SDG 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504091-0166.d Sampled: 04/21/15 12:00

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504091-01 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 01:15

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	43.61	87	45 - 110	
2-Fluorobiphenyl	50.00	39.74	79	46 - 110	
Terphenyl-d14	50.00	46.62	93	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16-3

Client: DRAPER ADEN ASSOCIATES SDG 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504091-0266.d Sampled: 04/21/15 13:00

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504091-02 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 01:54

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	40.36	81	45 - 110	
2-Fluorobiphenyl	50.00	39.78	80	46 - 110	
Terphenyl-d14	50.00	48.44	97	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16-5

Client: DRAPER ADEN ASSOCIATES SDG 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504091-0366.d Sampled: 04/21/15 14:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504091-03 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 02:34

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	46.65	93	45 - 110	
2-Fluorobiphenyl	50.00	40.64	81	46 - 110	
Terphenyl-d14	50.00	47.65	95	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16SPRING

Client: DRAPER ADEN ASSOCIATES SDG 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504091-0566.d Sampled: 04/21/15 14:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504091-05 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 03:52

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	42.91	86	45 - 110	
2-Fluorobiphenyl	50.00	38.87	78	46 - 110	
Terphenyl-d14	50.00	47.26	95	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16WC2B

Client: DRAPER ADEN ASSOCIATES SDG 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1504091-0466.d Sampled: 04/22/15 09:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1504091-04 Received: 04/23/15 14:10

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/28/15 03:13

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	41.34	83	45 - 110	
2-Fluorobiphenyl	50.00	37.51	75	46 - 110	
Terphenyl-d14	50.00	47.40	95	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Environmental Testing Laboratories CompuChem A Division Of Liberty Analytical Corp.

ACCREDITED IN ACCORDANCE WITH nelac

INITIAL CALIBRATION DATA

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
2,6-Dinitrotoluene	5	0.2530117	10	0.3038136	25	0.3125104	40	0.3064479	50	0.3584601	60	0.3314056
2,4-Dinitrotoluene	5	0.3047905	10	0.3694067	25	0.4262929	40	0.4351384	50	0.4650856	60	0.4583921
Diethylphthalate	5	1.415875	10	1.487223	25	1.469259	40	1.465198	50	1.587364	60	1.469072
Nitrobenzene-d5	5	0.3356	10	0.3676778	25	0.3786647	40	0.3849323	50	0.3961878	60	0.3869809
2-Fluorobiphenyl	5	1.301265	10	1.282714	25	1.263109	40	1.287132	50	1.296097	60	1.261813
Terphenyl-d14	5	0.677909	10	0.7315459	25	0.7554064	40	0.7386834	50	0.7516484	60	0.7314786

INITIAL CALIBRATION DATA (Continued)

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Calibration: 5040707 Instrument: 5972hp66

Calibration Date: 4/6/2015 12:01:43PM

Compound	Mean RF	% RSD	Mean RT	RT RSD	Linear r	Quad COD	RSD LIMIT	Q
2,6-Dinitrotoluene	0.3109416	11.23877	14.34967	6.058479E-02			CCC (20)	
2,4-Dinitrotoluene	0.409851	15.0368	15.203	3.776314E-02	0.9987893		CCC (20)	
Diethylphthalate	1.482332	3.82959	15.82133	5.393093E-02			CCC (20)	
Nitrobenzene-d5	0.3750073	5.732318	9.014167	3.855882E-02			CCC (20)	
2-Fluorobiphenyl	1.282022	1.286947	13.24567	2.624517E-02			CCC (20)	
Terphenyl-d14	0.731112	3.820085	20.27933	0.016046			CCC (20)	

SECOND-SOURCE CALIBRATION VERIFICATION

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Instrument: 5972hp66 Calibration: 5040707

Lab File ID: 5D06001-SCV166.d Standard ID: 4J14021

Sequence: 5D06001 Injection Date: 04/06/15

Lab Sample ID: 5D06001-SCV1 InjectionTime: 16:20

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
2,6-Dinitrotoluene	25.00	25.0	-0.1	30.00
2,4-Dinitrotoluene	25.00	24.9	-0.2	30.00
Diethylphthalate	25.00	25.1	0.4	30.00

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1504091

Project: RAAP 2013 UNIT 16 & 10/B03204-13

Instrument ID: 5972hp66 Calibration: 5040707

Lab File ID: 5D27004-ICV166.d Calibration Date: 04/06/15 12:01

Sequence: 5D27004 Injection Date: 04/27/15

Lab Sample ID: 5D27004-ICV1 Injection Time: 17:21

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT
2,6-Dinitrotoluene	Avg	25.00	25.5	0.3109416	0.3155381	0.2	1.5	20
2,4-Dinitrotoluene	Lin	25.00	24.5	0.409851	0.4202458	0.2	-2.0	20
Diethylphthalate	Avg	25.00	25.5	1.482332	1.508754	0.01	1.8	20
Nitrobenzene-d5	Avg	25.00	26.00	0.3750073	0.3918735	0.05	4.5	20
2-Fluorobiphenyl	Avg	25.00	25.00	1.282022	1.291809	0.05	0.8	20
Terphenyl-d14	Avg	25.00	25.00	0.731112	0.7259737	0.05	-0.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Data File: /chem/5972hp66.i/D5D06001A66.b/5D06001-TUN166.d

Date : 06-APR-2015 12:01

Client ID: DFTPPCS

Instrument: 5972hp66.i

Sample Info: 5D06001-TUN1:OWS

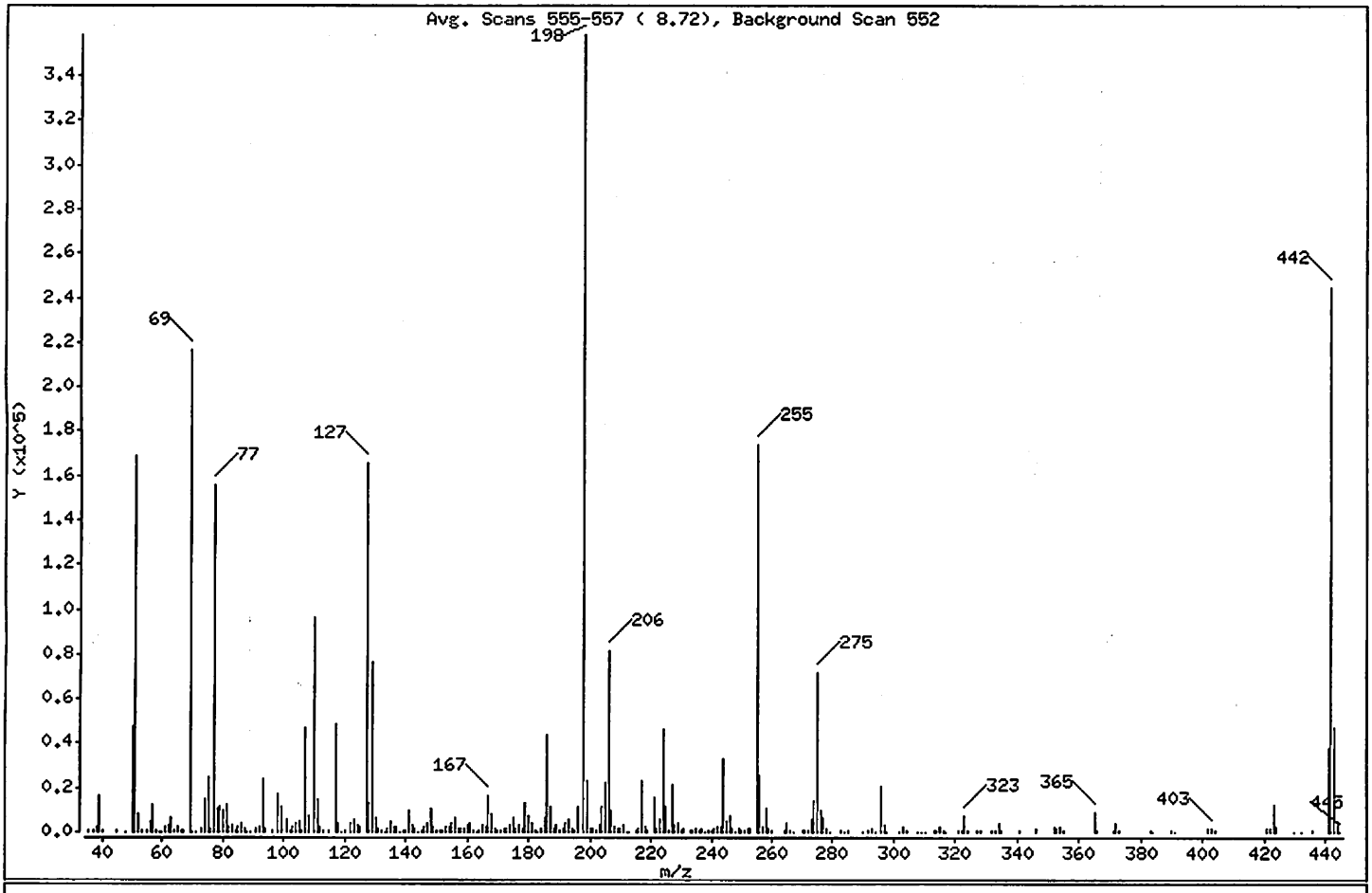
Volume Injected (uL): 2.0

Operator: OWS

Column phase: RTX-5MS

Column diameter: 0.32

1 Decafluorotriphenylphosphine



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	10.00 - 80.00% of mass 198	47.23
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	60.48
70	Less than 2.00% of mass 69	0.02 (0.02)
127	10.00 - 80.00% of mass 198	46.31
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.41
275	10.00 - 60.00% of mass 198	20.09
365	Greater than 1.00% of mass 198	2.59
441	Present, but less than mass 443	10.47
442	50.00 - 100.00% of mass 198	68.34
443	15.00 - 24.00% of mass 442	13.20 (19.31)

Rakdu Ham 4/7/2015

DFTPP TUNE/TAILING FACTOR/DEGRADATION SUMMARY RESULTS

DECAFLUOROTRIPHENYLPHOSPHINE Ion Abundance/Ratio Criteria Chart

Ion	Abundance Criteria	Base Peak	Other	Test
198	Base Peak, 100% relative abundance	100.00		PASS
51	10 - 80% of mass 198	47.23		PASS
68	Less than 2% of mass 69	0.00	(0.00)	PASS
69	Mass 69 relative abundance	60.48		PASS
70	Less than 2% of mass 69	0.02	(0.02)	PASS
127	10 - 80% of mass 198	46.31		PASS
197	Less than 2% of mass 198	0.00	(0.00)	PASS
199	5 - 9% of mass 198	6.41		PASS
275	10 - 60% of mass 198	20.09		PASS
365	Greater than 1% of mass 198	2.59		PASS
441	Present, but less than mass 443	10.47	(79.35)	PASS
442	50 - 100% of mass 198	68.34		PASS
443	15 - 24% of mass 442	13.20	(19.31)	PASS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	1.21	2.0	PASS
Benzidine	0.77	2.0	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	922028			N/A
4,4-DDE	423	0.0	20.0	PASS
4,4-DDD	4867	0.5	20.0	PASS
4,4-DDD + DDE	5290	0.6	20.0	PASS

*
Tuning Sample, /chem/5972hp66.i/D5D06001A66.b/5D06001-TUN166.d/5D06001-TUN166.d,
*

Data File: /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d

Date : 27-APR-2015 16:59

Client ID: DFTPPCY

Instrument: 5972hp66.i

Sample Info: 5D27004-TUN1:OWS

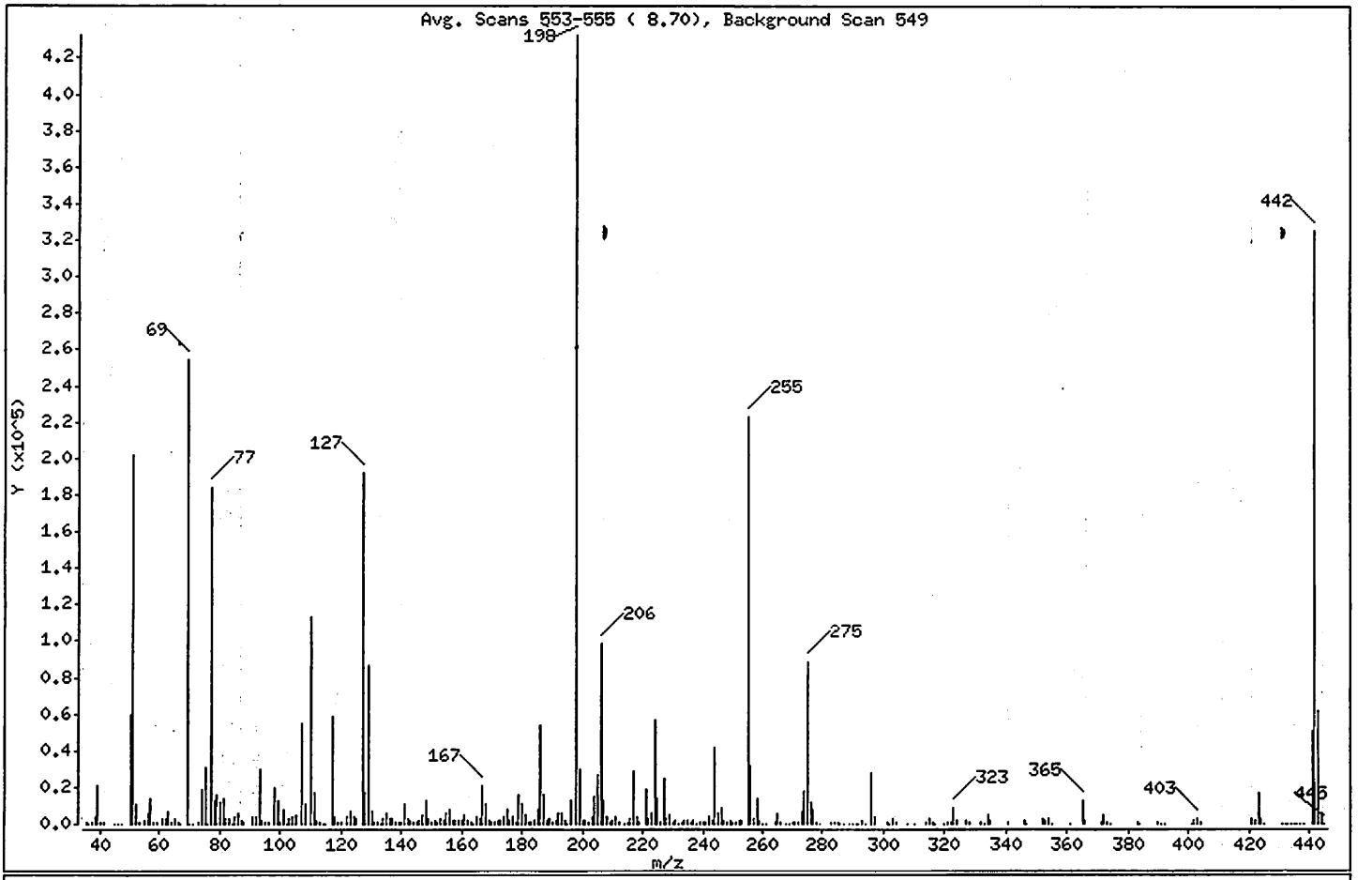
Volume Injected (uL): 2.0

Operator: OWS

Column phase: RTX-5MS

Column diameter: 0.32

1 Decafluorotriphenylphosphine



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	10.00 - 80.00% of mass 198	46.58
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	58.82
70	Less than 2.00% of mass 69	0.11 (0.18)
127	10.00 - 80.00% of mass 198	44.42
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.91
275	10.00 - 60.00% of mass 198	20.45
365	Greater than 1.00% of mass 198	2.90
441	Present, but less than mass 443	11.76
442	50.00 - 100.00% of mass 198	75.28
443	15.00 - 24.00% of mass 442	14.16 (18.81)

Rakdu Ham 4/28/2015

DFTPP TUNE/TAILING FACTOR/DEGRADATION SUMMARY RESULTS

DECAFLUOROTRIPHENYLPHOSPHINE Ion Abundance/Ratio Criteria Chart

Ion	Abundance Criteria	Base Peak	Other	Test
198	Base Peak, 100% relative abundance	100.00		PASS
51	10 - 80% of mass 198	46.58		PASS
68	Less than 2% of mass 69	0.00	(0.00)	PASS
69	Mass 69 relative abundance	58.82		PASS
70	Less than 2% of mass 69	0.11	(0.18)	PASS
127	10 - 80% of mass 198	44.42		PASS
197	Less than 2% of mass 198	0.00	(0.00)	PASS
199	5 - 9% of mass 198	6.91		PASS
275	10 - 60% of mass 198	20.45		PASS
365	Greater than 1% of mass 198	2.90		PASS
441	Present, but less than mass 443	11.76	(83.08)	PASS
442	50 - 100% of mass 198	75.28		PASS
443	15 - 24% of mass 442	14.16	(18.81)	PASS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	0.50	2.0	PASS
Benzidine	1.03	2.0	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	1527033			N/A
4,4-DDE	716	0.0	20.0	PASS
4,4-DDD	3405	0.2	20.0	PASS
4,4-DDD + DDE	4121	0.3	20.0	PASS

Tuning Sample, /chem/5972hp66.i/D5D27004C66.b/5D27004-TUN166.d/5D27004-TUN166.d,

ANALYSIS DATA SHEET

SW8270D

SBLKVI

Client: DRAPER ADEN ASSOCIATES SDG: 1504091 Project: RAAP 2013 UNIT 16 & 10/B03204-13

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5042401-BLK166.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5042401-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 04/27/15 10:23

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 04/27/15 18:00

Batch: 5042401 Sequence: 5D27004 Calibration: 5040707 Instrument: 5972hp66

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	U
121-14-2	2,4-Dinitrotoluene			10	U
84-66-2	Diethylphthalate			5.0	U

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	45.65	91	45 - 110	
2-Fluorobiphenyl	50.00	41.29	83	46 - 110	
Terphenyl-d14	50.00	46.11	92	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

B. Patterson
Assigned To
2713
Employee ID Number

Matrix: Water

PREPARATION BENCH SHEET

H: 4/27
D: 5/13

5042401

SVOC 8270D

Prepared using: SVOA - EPA 3510C_SVOA

Date/Time Extracted: 4-27-15 @ 1023

Lab Number	Client ID	QCType	Initial (mL)	Final (uL)	Adjusted pH		QC	Surr (uL)	Comments
					A/N	BASE			
1504088-01	5W7B	Sample	1000	1000	1.6	13	QC	500	
1504088-02	5W5B	Sample	1000	1000	1.6	13	NR	500	
1504088-03	5WC21	Sample	1000	1000	1.6	13		500	
1504088-04	5WDUP	Sample	1000	1000	1.3	13		500	
1504088-05	5WC22	Sample	1000	1000	1.9	13		500	
1504088-06	5WC23	Sample	1000	1000	1.6	13		500	
1504091-01	16-2	Sample	1000	1000	1.6	13		500	
1504091-02	16-3	Sample	1000	1000	1.9	13		500	
1504091-03	16-5	Sample	1000	1000	1.9	13		500	
1504091-04	16WC2B	Sample	1000	1000	1.6	13		500	
1504091-05	16SPRING	Sample	1000	1000	1.6	13		500	
5042401-BLK1	SBLKV1	Blank	1000	1000	1.6	13		500	
5042401-BS1	SLCSV1	LCS	1000	1000	1.6	13		500	
5042401-BSD1	SLCSDV1	LCS Dup	1000	1000	1.9	13		500	
5042401-MS1	5W7BMS	Matrix Spike	1000	1000	1.9	13		500	
5042401-MSD1	5W7BMSD	Matrix Spike Dup	1000	1000	1.6	13	NR	500	

4-27-15

	Description	Spike Amount (uL)		Lot Number
SURROGATE	NSI BNA Surrogates (SW 846) (WL-3	500		5D27002
SPIKE	8270 Full Short LCS/MS Spike 1	500	LCS/LCSD	5C30005
SPIKE	8270 Full Short LCS/MS Spike 1	500	MS/MSD	5C30005

Analysts Initials: Extracted: BFP, CH KD: CH, BFP N2: BFP Bottled up: BFP

Surrogate & Spike Added By: BFP 4-27-15
Initials / Date

Spiking Witnessed By: CH 4.27.15
Initials / Date

Final Vol Verified:

Reviewed By: CH Cooley

Manuf. and lot # of reagents/solvents used: Na_2SO_4 - 5D03003, CH_2Cl_2 - 5D20002, H_2SO_4 - 4F27003, 10N NaOH - 5C31014

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Data Validation Summary

Second Quarter 2015 Groundwater Monitoring Event - Annual Monitoring under 40 CFR 264 Appendix IX For HWMU-16; and Corrective Action Annual Groundwater Monitoring Event for HWMU-5

Final Hazardous Waste Post-Closure Care Permit for Hazardous Waste Management Units 5 and 16 Radford Facility Army Ammunition Plant, Radford, Virginia EPA ID# VA1210020730

Draper Aden Associates performed data validation of the analytical results for the Second Quarter 2015 semiannual groundwater monitoring event at Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP), in Radford, Virginia. The monitoring event also served as annual monitoring under 40 CFR 264 Appendix IX for HWMU-16. As well, the event served as the 11th corrective action semiannual monitoring for HWMU-5 conducted in accordance with the *Final Hazardous Waste Post-Closure Care Permit for HWMU 5 and 16 (reissued August 16, 2014).* The following information and attached tables summarize the data validation results.

Sample Collection/Analytical Services

Draper Aden Associates, of Blacksburg, Virginia, collected groundwater samples during April 20 -22, 2015.

Samples were submitted for laboratory analysis via courier to CompuChem, a Division of Liberty Analytical (CompuChem), of Cary, North Carolina; and to Eurofins Lancaster Laboratories Environmental, LLC, (ELLE) of Lancaster, Pennsylvania.

Receipt of Monitoring Event Data

On behalf of BAE SYSTEMS, Ordnance Systems, Inc., each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results. The final certificate of analysis for the event was received on May 14, 2015.

Verification Events

Verification sampling was required and conducted on May 26, 2015, at HWMU-16 to confirm or refute detections of concern reported for the Second Quarter 2015 monitoring event. Results of the verification event are summarized below and reported in the permit required semiannual groundwater monitoring report. The final certificate of analysis for the event was received on July 8, 2015.

- ***HWMU-16:*** Cobalt was initially detected in well 16WC1A and 16MW9 above the QL. The verification results did not confirm the original detections and the verification results were reported as the final results. No further action was required.

Summary of Monitoring Event Data by Analytical Method

Certificates of analysis were received from each laboratory in the following sample delivery groups (SDGs):

Summary of Required Analytical Methods and SDGs

Analytical Method	Hazardous Waste Management Unit	
	HWMU-5	HWMU-16
8260C Volatiles	RAE35	RAE 37
8270D Semivolatiles	1504088	1504090 1504091
6020A/6010C Inorganics	1504088 1504089	1504090 1504091 1505062 (verification event)
9012B Cyanide	Not required	1504090
7470A Mercury	1504088	1504090 1504091

Each final certificate of analysis was complete in its presentation and the data were of acceptable quality. Chains of custody and permit required target analytes are provided in each SDG.

Data Analysis and Validation

Samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates).* Data were evaluated in general accordance with:

- *Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods*, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, October 1999 and *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, June 2008, where applicable.
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010*, where applicable.

Draper Aden Associates, of Blacksburg, Virginia, performed a comprehensive data validation, including recalculation of 10% of the data, where noted. For each HWMU, data validation reports and a summary table of data validation results are provided as an attachment (Appendix A – data validation summary tables, Appendix B – data validation reports [CD ROM]).

Reporting of Results

For HWMU-16, compliance well results were reported to at or above the detection limit for the target analytes (constituents) listed in Appendix IX to 40 CFR Part 264 as presented in Appendix I of Attachment 1 of the Final Post-Closure Care Permit. The 8270D target analyte detection limits vary slightly from the permit required detection limit; however, no corrective action was needed. Results reported between the detection limit and quantitation limit should be considered estimated concentrations. Plume well results were reported to at or above the permit quantitation limit for the constituents listed in the semiannual compliance monitoring lists (Attachment 3 Appendix E).

For HWMU-5, results were reported to at or above the permit detection limit for the target analytes (constituents) listed in Appendix J to Permit Attachment 2 and Appendix K to Permit Attachment 2 of Module VI-Groundwater Corrective Action & Monitoring Program for Unit-5, with the exception of Methods 8260C and 8270D target analytes. Select 8260C and 8270D target analyte detection limits based on current laboratory method detection limit studies varied slightly from the detection limit listed in the permit; however, no corrective action was needed. Results reported between the detection limit and quantitation limit should be considered estimated concentrations.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

This Report has been prepared by:

Janet C. Frazier
Senior Environmental Scientist
2206 South Main Street, Blacksburg, Virginia 24060; 540-552-0444
jfrazier@daa.com

7/27/2015
Date:

This Report has been subjected to technical and quality review by:

Ross G. Miller
Senior Project Geologist
2206 South Main Street, Blacksburg, Virginia 24060; 540-552-0444
rmiller@daa.com

7/27/2015
Date:

Comprehensive Data Validation Report

Draper Aden Associates
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Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Radford Army Ammunition Plant (RFAAP), Radford, Virginia

Facility: HWMU-5 Monitoring Event: Second Quarter 2015

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Barium	5WC21	13.6		13.6		10	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WDUP	14.6		14.6		10	No action taken. Blind field duplicate 5WC21. RPD<20.
Cobalt	5WC21	64.9		64.9		5	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WDUP	69.4		69.4		5	No action taken. Blind field duplicate 5WC21. RPD<20.
Nickel	5WC21	33.9		33.9		10	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WDUP	34		34		10	No action taken. Blind field duplicate 5WC21. RPD<20.
Zinc	5WC21	30.3		30.3		10	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WDUP	33.7		33.7		10	No action taken. Blind field duplicate 5WC21. RPD<20.
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Chloroform	5WC21	1.1		1.1	J	1	MS recovered low (65%). Sample/blind field duplicate 5WDUP. RPD<20.
	5WDUP	1		1	J	1	MS recovered low (65%). Blind field duplicate 5WC21. RPD<20.
Trichloroethene	5WC21	3.2		3.2		1	No action taken. Sample/blind field duplicate 5WDUP. RPD<20.
	5WDUP	3		3		1	No action taken. Blind field duplicate 5WC21. RPD <20.

Definitions:
Data Validation Qualifiers:
QL Denotes permit quantitation limit. Q Denotes data qualifier.
J Denotes analyte reported at or above quantitation limit and associated result is estimated.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 6020A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Antimony	5W5B	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.4	U	U		2	0.4			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Arsenic	5W5B	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Barium	5W5B	26		26		10	1			ug/l	No action taken.
	5W7B	40.3		40.3		10	1			ug/l	No action taken.
	5WC21	13.6		13.6		10	1			ug/l	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WC22	31.3		31.3		10	1			ug/l	No action taken.
	5WC23	34.3		34.3		10	1			ug/l	No action taken.
	5WDUP	14.6		14.6		10	1			ug/l	No action taken. Blind field duplicate 5WC21. RPD<20.
Beryllium	5W5B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.912	J	0.912	J	1	0.2			ug/l	Result < QL.
	5WC22	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.976	J	0.976	J	1	0.2			ug/l	Result < QL. Blind field duplicate 5WC21.
Cadmium	5W5B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.

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Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 6020A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Cadmium	5W7B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.548	J	0.548	J	1	0.2			ug/l	Result < QL.
	5WC22	0.315	J	0.315	J	1	0.2			ug/l	Result < QL.
	5WC23	0.318	J	0.318	J	1	0.2			ug/l	Result < QL.
	5WDUP	0.581	J	0.581	J	1	0.2			ug/l	Result < QL. Blind field duplicate 5WC21.
Chromium	5W5B	1	U	U		5	1			ug/l	Analyte not detected at or above DL or QL.
	5W7B	1	U	U		5	1			ug/l	Analyte not detected at or above DL or QL.
	5WC21	4.17	J	4.17	J	5	1			ug/l	Result < QL.
	5WC22	1	U	U		5	1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	2.87	J	2.87	J	5	1			ug/l	Result < QL.
	5WDUP	4.47	J	4.47	J	5	1			ug/l	Result < QL. Blind field duplicate 5WC21.
Cobalt	5W8B	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.
	5W5B	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.
	5W7B	2.34	J	2.34	J	5	1	5	1	ug/l	Result < QL.
	5WC21	64.9		64.9		5	1	5	1	ug/l	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WC22	17		17		5	1	5	1	ug/l	No action taken.
	5WC23	11.1		11.1		5	1	5	1	ug/l	No action taken.
	5WDUP	69.4		69.4		5	1	5	1	ug/l	No action taken. Blind field duplicate 5WC21. RPD<20.
	5W12A	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.
Copper	5W5B	1.64	J	1.64	J	5	1			ug/l	Result < QL.
	5W7B	1.52	J	1.52	J	5	1			ug/l	Result < QL.
	5WC21	3.93	J	3.93	J	5	1			ug/l	Result < QL.
	5WC22	1	U	U		5	1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	2.98	J	2.98	J	5	1			ug/l	Result < QL.
	5WDUP	4.03	J	4.03	J	5	1			ug/l	Result < QL. Blind field duplicate 5WC21.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 6020A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Lead	5W5B	0.774	J	0.774	J	1	0.2			ug/l	Result < QL.
	5W7B	0.603	J	0.603	J	1	0.2			ug/l	Result < QL.
	5WC21	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.202	J	0.202	J	1	0.2			ug/l	Result < QL.
	5WC23	0.827	J	0.827	J	1	0.2			ug/l	Result < QL.
	5WDUP	0.224	J	0.224	J	1	0.2			ug/l	Result < QL. Blind field duplicate 5WC21.
Nickel	5W5B	2.15	J	2.15	J	10	2			ug/l	Result < QL.
	5W7B	2	U	U		10	2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	33.9		33.9		10	2			ug/l	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WC22	7.22	J	7.22	J	10	2			ug/l	Result < QL.
	5WC23	8.86	J	8.86	J	10	2			ug/l	Result < QL.
	5WDUP	34		34		10	2			ug/l	No action taken. Blind field duplicate 5WC21. RPD<20.
Selenium	5W5B	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5W7B	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WC21	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WC23	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Silver	5W5B	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Thallium	5W5B	0.318	J	0.318	J	1	0.2			ug/l	Result < QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 6020A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Thallium	5W7B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Vanadium	5W5B	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5W7B	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5WC21	1.26	J	1.26	J	10	1			ug/l	Result < QL.
	5WC22	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	3.76	J	3.76	J	10	1			ug/l	Result < QL.
	5WDUP	1.34	J	1.34	J	10	1			ug/l	Result < QL. Blind field duplicate 5WC21.
Zinc	5W5B	7.11	J	7.11	J	10	3			ug/l	Result < QL.
	5W7B	16.7		16.7		10	3			ug/l	No action taken.
	5WC21	30.3		30.3		10	3			ug/l	No action taken. Blind field duplicate 5WDUP. RPD<20.
	5WC22	6.89	J	6.89	J	10	3			ug/l	Result < QL.
	5WC23	12.1		12.1		10	3			ug/l	No action taken.
	5WDUP	33.7		33.7		10	3			ug/l	No action taken. Blind field duplicate 5WC21. RPD<20.
Method: 7470A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Mercury	5W5B	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.2	U	U		2	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
Acetone	5W5B	12		12		10	3			ug/l	No action taken.
	5W7B	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WC21	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WC23	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	3	U	U		10	3			ug/l	Analyte not detected at or above DL or QL.
2-Butanone	5W5B	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5W7B	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5WC21	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	1	U	U		10	1			ug/l	Analyte not detected at or above DL or QL.
Chloroform	5W5B	1.2		1.2	J	1	0.1			ug/l	Result < QL. MS recovered low (65%).
	5W7B	25		25	J	1	0.1			ug/l	MS recovered low (65%).
	5WC21	1.1		1.1	J	1	0.1			ug/l	MS recovered low (65%). Sample/blind field duplicate 5WDUP. RPD<20.
	5WC22	0.6	J	0.6	J	1	0.1			ug/l	Result < QL. MS recovered low (65%).
	5WC23	0.8	J	0.8	J	1	0.1			ug/l	Result < QL. MS recovered low (65%).
	5WDUP	1		1	J	1	0.1			ug/l	MS recovered low (65%). Blind field duplicate 5WC21. RPD<20.
	Trip Blank 1	0.1	U	U	J	1	0.1			ug/l	Analyte not detected at or above DL or QL. MS recovered low (65%).
	Trip Blank 2	0.1	U	U	J	1	0.1			ug/l	Analyte not detected at or above DL or QL. MS recovered low (65%).
Dichlorodifluoromethane	5W5B	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
Dichlorodifluoromethane	5W7B	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.3	U	U		1	0.3			ug/l	Analyte not detected at or above DL or QL.
1,2-Dichloroethane	5W5B	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
1,1-Dichloroethene	5W8B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.

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Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
cis-1,2-Dichloroethene	5W8B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
trans-1,2-Dichloroethene	5W8B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
Diethyl ether	5W5B	0.4	U	U		12	0.4			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.4	U	U		12	0.4			ug/l	Analyte not detected at or above DL or QL.
	5WC21	1.4	J	1.4	J	12	0.4			ug/l	Result < QL.
	5WC22	4.5	J	4.5	J	12	0.4			ug/l	Result < QL.
	5WC23	11	J	11	J	12	0.4			ug/l	Result < QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
Diethyl ether	5WDUP	1.4	J	1.4	J	12	0.4			ug/l	Result < QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.4	U	U		12	0.4			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.4	U	U		12	0.4			ug/l	Analyte not detected at or above DL or QL.
Methylene chloride	5W5B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.2	U	U		1	0.2			ug/l	Analyte not detected at or above DL or QL.
Toluene	5W5B	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.1	U	U		1	0.1			ug/l	Analyte not detected at or above DL or QL.
Trichloroethene	5W8B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5WC21	3.2		3.2		1	0.2	1	0.177	ug/l	No action taken. Sample/blind field duplicate 5WDUP. RPD<20.
	5WC22	3.5		3.5		1	0.2	1	0.177	ug/l	No action taken.
	5WC23	4.6		4.6		1	0.2	1	0.177	ug/l	No action taken.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
Trichloroethene	5WDUP	3		3		1	0.2	1	0.177	ug/l	No action taken. Blind field duplicate 5WC21. RPD <20.
	5W12A	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
Vinyl chloride	5W8B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
Xylenes (Total)	5W5B	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	Trip Blank 1	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.2	U	U		3	0.2			ug/l	Analyte not detected at or above DL or QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8270D											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
bis(2-Ethylhexyl)phthalate	5W5B	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL.
	5W7B	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WC21	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WC23	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	6	U	U		6	1.5			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Diethyl phthalate	5W5B	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL.
	5W7B	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL.
	5WC21	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL.
	5WC23	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	10	U	U		10	0.52			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
2,4-Dinitrotoluene	5W5B	10	U	U		10	0.84			ug/l	Analyte not detected at or above DL or QL.
	5W7B	10	U	U		10	0.84			ug/l	Analyte not detected at or above DL or QL.
	5WC21	3	J	3	J	10	0.84			ug/l	Result < QL. Blind field duplicate 5WDUP.
	5WC22	2.8	J	2.8	J	10	0.84			ug/l	Result < QL.
	5WC23	2.8	J	2.8	J	10	0.84			ug/l	Result < QL.
	5WDUP	2.9	J	2.9	J	10	0.84			ug/l	Result < QL. Blind field duplicate 5WC21.
2,6-Dinitrotoluene	5W5B	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL.
	5W7B	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL.
	5WC21	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL.
	5WC23	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	10	U	U		10	0.75			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
o-Nitroaniline	5W5B	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes
Method: 8270D											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
o-Nitroaniline	5W7B	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WC21	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WC23	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	10	U	U		10	1.5			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
p-Nitroaniline	5W5B	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL.
	5W7B	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL.
	5WC21	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL.
	5WC23	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	20	U	U		20	2.7			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
Nitrobenzene	5W5B	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL.
	5W7B	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL.
	5WC21	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL.
	5WC23	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL.
	5WDUP	10	U	U		10	1.3			ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.

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Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL-Appendix J Analytes	Permit DL-Appendix J Analytes	Unit	Validation Notes

Definitions:

QL Denotes quantitation limit.
DL Denotes detection limit
Q Denotes data qualifier.
U Denotes analyte not detected at or above Detection Limit (DL) or Quantitation Limit (QL).
UA Denotes analyte not detected at or above adjusted sample DL or QL.
J Denotes analyte reported at or above the DL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above DL and QL and DL and QL are estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted DL and QL and adjusted DL and QL are estimated.
R Denotes result rejected.
Laboratory Data Qualifiers, "U" and "<", denote not detected at or above the QL.

SW-846 METHODS 6020A AND 7470A INORGANIC DATA REVIEW SUMMARY

Draper Aden Associates performed a manual comprehensive data review of the analytical results for the April 20-21, 2015 Corrective Action groundwater monitoring event for Hazardous Waste Management Unit 5 (HWMU 5) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected the groundwater samples from monitoring wells 5W8B, 5W5B, 5W7B, 5WC21, 5WC22, 5WC23, and 5W12A. Groundwater sample 5WDUP was submitted to the laboratory as a blind sample duplicate for 5WC21. The following information and attached table summarize the inorganic data validation results. Validation of other required methods is presented on separate reports.

For this Corrective Action annual groundwater monitoring event, samples 5W5B, 5W7B, 5WC21, 5WC22 and 5WC23 (downgradient point of compliance (POC) wells) were analyzed for the sixteen inorganic constituents listed in Appendix K of the facility's permit by SW-846 Method 6020A and SW-846 Method 7470A. Samples 5W8B (upgradient groundwater monitoring well) and 5W12A (plume monitoring well) were analyzed for cobalt only by SW-846 Method 6020A.

Inductively coupled plasma atomic emission spectroscopy/mass spectrometry (ICP-MS) and cold vapor atomic absorption (CVAA) were the techniques used for the metal analyses. ICP-MS Method 6020A was used to analyze for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, selenium, silver, thallium, vanadium and zinc. CVAA Method 7470A was used to analyze for mercury. Target analytes were analyzed for total (T) concentrations.

Draper Aden Associates sent samples to CompuChem, a Division of Liberty Analytical, (CompuChem), of Cary, North Carolina. CompuChem performed the Method 6020A and 7470A analyses. On behalf of RFAAP, CompuChem submitted results to Draper Aden Associates in a final certificate of analysis, which included sample analytical results, as well as relevant documentation to validate and verify the results. CompuChem is a VELAP accredited laboratory for the above analytes, methods and matrix.

The evaluation of CompuChem's compliance with the method and validation of results presented here are based upon a review of QA/QC information including chain-of-custody, case narrative, holding times, preservation procedures, instrument calibration, tuning, blank (method, calibration and other blanks), interference check sample, matrix spike/matrix spike duplicate (MS/MSD), laboratory control sample (LCS), internal standard, and serial dilution data. A review of transcriptions from instrument data to sample summary sheets was performed. Calculation checks were performed on ten percent of the data set, where applicable. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

CompuChem received the samples on ice and in good condition with custody seals intact. The chain of custody was appropriately signed and dated by field and laboratory personnel, except where noted below. Applicable holding time and preservation criteria were met.

The laboratory's courier inadvertently signed the chain of custody at 10:30 instead of 10:35. The field personnel was present at the sample exchange and noted the time. No data qualification was necessary.

Method 6020A (ICP-MS)

The original certificates of analysis were received on May 11, 2015. The certificates of analysis appeared complete in its presentation and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported permit quantitation limit (QL). The laboratory revised the certificate of analysis to include the current method detection limit (MDL) study.

QC history documentation was provided. Applicable preservation and technical holding time criteria were met. Instrument calibration, calibration verification and tuning requirements were met. QL check standards, blank, interference check samples (ICSAB), MS/MSD, LCS, internal standard data, and serial dilution sample results were within control limits, where applicable. Field duplicate/sample results exhibited acceptable precision. Calculation checks were performed on ten percent of the data set. A review of transcriptions from instrument data to sample summary sheets was performed. Deviations from QA/QC criteria that were noted during data review are summarized below.

The QL standard concentration for antimony was 2 µg/l instead of 1 µg/l. The instrument data were evaluated and antimony was not detected in any sample at or above the detection limit or QL and no data qualification was required for antimony. The QL standard concentration was at or below the project QL for the other analytes.

For this Corrective Action groundwater monitoring event, sample results were reported to at or above the permit specified detection limit (DL). Target analytes detected at or above the DL or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table.

Results for samples unaffected by the data validation process and reported as not detected at or above the DL were validated and qualified "U." Reported values less than the QL should be considered estimated concentrations and were validated and qualified "J." No results were rejected based on the data validation criteria.

Method 7470A (CVAA)

The original certificate of analysis was received on May 11, 2015. The certificate of analysis appeared complete in its presentation and the final data were of acceptable quality. The certificate of analysis demonstrated the ability of the laboratory to achieve the reported permit QL for mercury.

QC history documentation was provided. Applicable preservation and technical holding time criteria were met. Instrument calibration and calibration verification criteria were met. QL

standard, blank, MS/MSD and LCS results recovered within control limits. Field duplicate/sample results exhibited acceptable precision, where applicable. Calculation checks were performed on ten percent of the data set. A review of transcriptions from instrument data to sample summary sheets was performed. No deviations from QA/QC criteria were noted during data review.

For this Corrective Action groundwater monitoring event, sample results were reported to at or above the permit detection limit. Target analytes detected at or above the detection limit or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table.

For this Corrective Action groundwater monitoring event, mercury results for the samples unaffected by the data validation process and not detected at or above the detection limit and/or QL were validated and reported as "U." No results were rejected based on the data validation criteria. No results were rejected based on the data validation criteria.

INORGANIC DATA EVALUATION FOR ICP/MS SW-846 METHOD 6020A

CompuChem, a Division of Liberty Analytical. Cary, NC; SDGs: 1504088, 1504089 (Co only)
Preparation Method 3005A

"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. DOCUMENTION COMPLETENESS CRITERIA:

Data Quality Objective: Representativeness

- ☑ Chain of custody – Custody transfers must be signed and dated
- ☑ Chain of custody properly and completely filled out including sampler signatures, date and time of sampling, sample ID, analysis requested

B. DETECTION LIMIT AND QUANTITATION LIMIT CRITERIA:

Data Quality Objective: Analytical Sensitivity

- ☑ Specific detection limit reported
- ☑ Specific quantitation limit reported
- ☑ Standard analyzed at the QL (LLQC), digested, 70-130% recovery, analyzed after MDL determination and as needed
- ☑ Instrument detection limit (IDL) less than QL
- ☑ Performance evaluation sample analyzed within 12 months

C. INITIAL DEMONSTRATION OF CAPABILITY (IDOC) CRITERIA:

Data Quality Objective: Laboratory Method Sensitivity

- ☑ Analyst IDOC for J. Feldhaus submitted previously

D. SAMPLE AND STANDARD PREPARATION CRITERIA:

Data Quality Objective: Accuracy and Representativeness

- ☑ Digestion prior to analysis
- ☑ Digestion method: 3005A
- ☑ Samples and standards matrix matched

E. TECHNICAL HOLDING TIME / PRESERVATION REQUIREMENTS:

Data Quality Objective: Representativeness

- ☑ 6 month holding time, pH<2 with Nitric Acid (HNO_3)

F. INSTRUMENT TUNE CRITERIA:

Data Quality Objective: Verify Operating Conditions

- ☑ Prior to calibration
- ☑ Relative Standard Deviation (RSD) </=5%
- ☑ Resolution < 0.9 amu full width at 10% peak height (or lower)
- ☑ Mass calibration </=0.1 amu difference from true value

G. INITIAL CALIBRATION CRITERIA:

Data Quality Objective: Laboratory Accuracy

- ☑ 1 calibration blank and at least 1 standard,
- ☑ Linear curve fit with correlation coefficient r>0.998
- ☑ Daily calibration following tuning and prior to sample analysis

H. INITIAL CALIBRATION VERIFICATION (ICV) CRITERIA:

Data Quality Objective: Laboratory Accuracy

- ☑ Daily following initial calibration
- ☑ ICV concentration near mid-point of calibration curve, 90-110% recovery
- ☑ Low level ICV (LLICV) – prior to analysis, at QL concentration, 70-130% recovery

I. INITIAL CALIBRATION BLANK CRITERIA:

Data Quality Objective: Laboratory Analytical Sensitivity/Instrument Drift/Contamination Evaluation

- ☑ Daily following ICV
- ☑ Interference free

J. CONTINUING CALIBRATION VERIFICATION (CCV) CRITERIA:

Data Quality Objective: Laboratory Analytical Accuracy

- ☑ CCV, prior to analysis, after every 10 samples, at end of analysis
- ☑ CCV recovery within 90-110%, mid-point of curve concentration
- ☑ Low level CCV (LLCCV), concentration at QL, prior to analysis, after every 10 samples, end of analysis (70-130% R)

K. CONTINUING CALIBRATION BLANK CRITERIA:

Data Quality Objective: Laboratory Analytical Sensitivity/Instrument Drift/Contamination Evaluation

- ☑ Immediately after the CCV, 10 sample frequency
- ☑ Interference free

L. BLANK CRITERIA:

Data Quality Objective: Sensitivity/Instrument Drift/Contamination Evaluation

- N/A Trip Blank (check only if analyzed)
- ☑ Method/Other Lab Blanks (check only if analyzed), one per digestion batch
- ☑ Interference free

M. INTERFERENCE CHECK SAMPLE (ICS) CRITERIA:

Data Quality Objective: Analytical Accuracy/Verification of Isobaric Interference Corrections

- ☑ At beginning of analytical run
- ☑ Recovery: 80-120%

N. MATRIX SPIKE DUPLICATE (MSD) OR SAMPLE DUPLICATE CRITERIA:

Data Quality Objective: Method Precision in Sample Matrix

- ☑ All analytes, one MSD or sample duplicate per batch of 20 samples
- ☑ Spiked prior to sample preparation
- ☑ RPD $\leq$ 20 between MS and MSD results or sample and duplicate results
- ☑ MSD analyte recovery 75-125%

O. MATRIX SPIKE (MS) CRITERIA:

Data Quality Objective: Method Accuracy in Sample Matrix

- ☑ All analytes, one MS per digestion batch of 20 samples
- ☑ Spiked prior to sample preparation
- ☑ Recovery: 75-125%
- ☑ Post digestion spike if MS/MSD recoveries low
- ☑ Recovery of post digestion spike analytes within 80-120%

P. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

Data Quality Objective: Laboratory Method Accuracy, Laboratory Performance

- ☑ LCS for all target analytes, one LCS per 20 sample batch
- ☑ LCS concentration at approximately mid-point of analytical curve

☑ Recovery within 80-120% for all analytes

Q. INTERNAL STANDARDS (IS) CRITERIA:

Data Quality Objective: Analytical Accuracy in Sample Matrix

☑ IS added to each sample and QC sample
☑ % Relative intensity (RI) within 70-125%

R. SERIAL DILUTION TEST CRITERIA:

Data Quality Objective: Accuracy in Sample Matrix

☑ Similar matrix, if concentration is 10X QL, then % Difference < 10%

S. SAMPLE QUANTITATION AND GENERAL REPORTING CRITERIA:

Data Quality Objective: n/a

☑ Sample results reported within instrument calibration range
☑ Sample results reported to the project detection limit
☑ Calculation checks on 10% of the data set
☑ Sample/Field duplicate RPD ≤ 20, where applicable

Draper Aden Associates conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, III and subsequent updates) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010). Validation of this data set is limited to review of items detailed in this data review report.

INORGANIC DATA EVALUATION FOR MERCURY BY COLD VAPOR AA METHOD 7470A

CompuChem, a Division of Liberty Analytical. Cary, NC; SDGs: 1504088
"☑" denotes items were reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA:
- ☑ Specific quantitation limit for mercury
- ☑ Specific detection limit for mercury, where applicable
- ☑ Electronic data file reviewed
- ☑ QC standard analyzed at or less than the QL (70-130%Recovery)
- ☑ Analyst IDOC for N. Bolton submitted previously
- ☑ Performance evaluation sample analyzed within 12 months

B. TECHNICAL HOLDING TIMES / PRESERVATION REQUIREMENTS:
- ☑ 28 days holding time
- ☑ Adjust pH <2 w/ HNO_3

C. INSTRUMENT CALIBRATION CRITERIA:
- ☑ 1 calibration blank and at least 5 standards
- ☑ Instrument calibrated for every analytical sequence for every method
- ☑ Linear curve fit with correlation coefficient r>0.995

D. INITIAL / CONTINUING CALIBRATION VERIFICATION CRITERIA:
- ☑ 10 sample frequency for CCV
- ☑ Recovery within 80-120% range

E. BLANK CRITERIA:
- N/A Trip Blank (check only if analyzed)
- N/A Equipment Blank (check only if analyzed)
- ☑ Method/other laboratory blanks (check only if analyzed)
- ☑ Interference free

F. DUPLICATE/MATRIX SPIKE DUPLICATE (MSD) CRITERIA:
- ☑ All target analytes: mercury
- ☑ One sample duplicate or matrix spike duplicate per batch of 20 samples
- ☑ RPD $\leq$ 20 for spike/sample values greater than 5 times QL
- ☑ RPD $\leq$ 20 between MS and MSD results

G. MATRIX SPIKE (MS) SAMPLE CRITERIA:
- ☑ Mercury, MS spiked prior to digestion
- ☑ Recovery within 75-125%

H. LABORATORY CONTROL SAMPLE CRITERIA:
- ☑ Recovery within 80-120%
- ☑ LCS for Mercury, one LCS per 20 sample batch

I. SAMPLE RESULTS CRITERIA:

- ☑ Results reported within instrument calibration range
- ☑ Results reported to detection limit
- ☑ Calculation checks on 10% of the data set
- ☑ Sample/Field duplicate RPD ≤ 20, where applicable

Draper Aden Associates conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, III and subsequent updates) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010). Validation of this data set is limited to review of items detailed in this data review report.

LIMITATIONS:

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Conclusions presented are based upon a review of available information, the results of our field studies, and/or professional judgment. To the best of our knowledge, information provided by others is true and accurate, unless otherwise noted.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

This Report has been prepared by:

Kathy Olsen Jr 7/7/15

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Kathy Olsen 7/7/15

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SW-846 METHOD 8260C VOLATILE ORGANIC DATA REVIEW SUMMARY

Draper Aden Associates performed a manual comprehensive review of the analytical results for the April 20-21, 2015 semiannual groundwater monitoring event at Hazardous Waste Management Unit 5 (HWMU 5) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected the groundwater samples from monitoring wells 5W8B, 5W5B, 5W7B, 5WC21, 5WC22, 5WC23 and 5W12A. Groundwater sample 5WDUP was submitted to the laboratory as a blind sample duplicate for 5WC21. The following information and attached table summarize the Method 8260C data validation results. Validation of other required methods is presented on separate reports.

For this Corrective Action annual groundwater monitoring event, samples 5W5B, 5W7B, 5WC21, 5WC22 and 5WC23 (downgradient point of compliance (POC) wells) were analyzed for five Appendix J and nine Appendix K volatile organic target analytes, as listed in the facility's permit, by USEPA SW-846 Method 8260C. Samples 5W8B (upgradient groundwater monitoring well) and 5W12A (plume monitoring well) were analyzed for the five Appendix J volatile organic target analytes by USEPA SW-846 Method 8260C.

Draper Aden Associates sent samples to Eurofins Lancaster Laboratories Environmental, (ELLE), of Lancaster, Pennsylvania. ELLE performed the SW-846 Method 8260C volatile analysis. ELLE is a VELAP accredited laboratory for the analytes, method and matrix as reported on the certificate of analysis. On behalf of RAAP, ELLE submitted results to Draper Aden Associates in a final certificate of analysis that included sample analytical results as well as relevant documentation to validate and verify the results (SDG RAE35).

The evaluation of ELLE's compliance with Method 8260C and validation of the results were based on a review of the following items: quality control (QC) deliverables package, QC history documentation, technical holding time and preservation requirements, instrument performance (tune) check, instrument calibration and calibration verification data, blank, surrogate spike, matrix spike and matrix spike duplicate (MS/MSD), laboratory control sample (LCS), internal standard, and/or target analyte identification and quantitation results. A review of transcriptions from instrument data to sample summary sheets was performed. Calculation verifications were performed on ten percent of the data set, where applicable. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

ELLE received the samples on ice and in good condition, with custody seals intact. The chain of custody was appropriately signed and dated by field and laboratory personnel. Applicable holding time and preservation criteria were met for the samples.

The original certificate of analysis was received on May 7, 2015. The original certificate of analysis appeared complete in its presentation and the data were of acceptable quality. The

certificate of analysis demonstrated the ability of the laboratory to achieve the permit required quantitation limit (QL) for each target analyte, except where noted below.

QC deliverables package requirements were met. QC history documentation and instrument performance check criteria were met. Sample holding time, preservation, initial calibration, calibration verification, blanks, surrogates, MS/MSD, LCS, and internal standards criteria were met, except where noted below. Field duplicate/sample results exhibited acceptable precision, where applicable. Sample results were verified and no transcription errors were observed.

Chloroform recovered low in the MS. Chloroform was detected in each sample and sample results for this analyte were validated and qualified "J" to note that the results were estimated due to the observed QC deficiency. The remaining MS/MSD/LCS criteria were met or no data qualifications were needed.

A 25 ml sample purge volume was used for the analysis of the target analytes.

Results were reported by the laboratory to at or above the laboratory method detection limit (MDL) for this Corrective Action monitoring event. The laboratory MDL was at or below the permit specified detection limit (DL), or slightly above, due to rounding.

Results for samples unaffected by the data validation process and reported as not detected at or above the MDL were validated and qualified "U." Except where noted above, reported values less than the quantitation limit (QL) should be considered estimated concentrations and were validated and qualified "J." No results were rejected based on the data validation criteria.

SW-846 METHOD 8260C (GC/MS) VOLATILE ORGANIC DATA VALIDATION

Comments: *Volatile organic analysis uses a purge and trap system to remove volatile organic target analytes from a 25 ml water sample (SW-846 5030C). Target analytes are separated and quantified using a capillary column gas chromatograph (GC)/mass spectrometer (MS).*

A. QC DELIVERABLES PACKAGE:

1.	Was the case narrative present/signed by a lab representative?	☑ YES ☐ NO
2.	Was the Chain of Custody present/signed by a lab representative?	☑ YES ☐ NO
3.	Were the sample results included for the sample locations?	☑ YES ☐ NO
4.	Did the laboratory report the required target analytes?	☑ YES ☐ NO
5.	Were the analyte QLs reported on reports in agreement with the instrument specific MDL study and project required QL?	☑ YES ☐ NO
6.	Were the sample locations, analytes and QLs in agreement with the electronic deliverable (EDD)?	☑ YES ☐ NO

Comments: QC deliverables package requirements were met.

B. QC HISTORY DOCUMENTATION CRITERIA:

1.	Was an instrument specific MDL study provided which included DL and QL values for the target analytes?	☑ YES ☐ NO
2.	Was the instrument calibration range provided?	☑ YES ☐ NO
3.	Were the instrument specific check sample data provided for the target analytes?	☑ YES ☐ NO

Comments: QC history documentation was provided and met criteria. The laboratory analyzed a MDL check sample at 0.1 µg/l (25 ml purge) for most target analytes.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1.	Was the 14-day sample collection to analysis holding time met?	☑ YES ☐ NO
2.	Were the samples received at ≤6°C, zero headspace?	☑ YES ☐ NO
3.	Were the sample pHs adjusted to < 2 with HCl?	☑ YES ☐ NO
4.	Were sample pHs adjusted to 4-5 with HCl? (Acrolein)	☑ NA ☐ YES ☐ NO
5.	Were samples analyzed unpreserved (2-Chloroethyl vinyl)	☑ NA ☐ YES ☐ NO

Comments: Technical holding time and sample preservation criteria were met.

D. GC/MS INSTRUMENT PERFORMANCE (TUNING) CHECK CRITERIA:

1. Was analysis of the instrument performance check solution performed at the beginning of each 12-hour period during which standards or samples were analyzed? ☑ YES ☐ NO
2. Was there documentation of the injection of 5-50 ng bromofluorobenzene (BFB)? ☑ YES ☐ NO
3. Were the ion abundance criteria met? ☑ YES ☐ NO
4. Were calibration, blank, and sample analyses performed within 12 hours of tuning? ☑ YES ☐ NO

Comments: Instrument performance check criteria were met.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1. Did the internal standard (IS) which was selected for target analyte RF calculation have a retention time close to the IS? ☑ YES ☐ NO
2. Were the target analytes included in the ICAL? ☑ YES ☐ NO
3. Were any calibration levels removed from the curve that would negatively influence the data integrity? ☐ YES ☑ NO
4. Did the ICALs consist of a minimum of 5 calibration levels? ☑ YES ☐ NO
5. Was the lowest concentration calibration standard at or below the associated MCL? ☑ YES ☐ NO
6. Was the calibration curve developed using the same purge volume used for sample analysis? ☑ YES ☐ NO
7. Were 8260C minimum Relative Response Factor (RRF) criteria met? *Refer to Table 4- SW-846 Method 8260C (Rev3 2/06) for specific analyte RRFs* ☑ YES ☐ NO
8. Was each target analyte %RSD ≤ 20%? ☑ YES ☐ NO
9. Was the correlation coefficient >0.99 for target analytes with ≥20 % RSD? *(System recalibrated if >10% analytes fail above condition)* ☑ NA ☐ YES ☐ NO
10. Was an initial calibration verification (ICV) standard analyzed immediately following the ICAL? ☑ YES ☐ NO
11. Was the recovery within 70-130%? ☑ YES ☐ NO
12. Was the ICV standard prepared from a different source from the ICAL ? ☑ YES ☐ NO

Method Validation Performance Criteria:

1. Did target analytes and surrogates that have RSDs > 20% have ≥0.99 correlation coefficient or coefficient of determination? ☑ NA ☐ YES ☐ NO
2. For linear regression curves, was the recalculated concentration of the low calibration point within ±30%? ☑ NA ☐ YES ☐ NO
3. For quadratic curves, was a minimum six standards used? ☑ NA ☐ YES ☐ NO

Comments: Initial calibration criteria were met.

F. CALIBRATION VERIFICATION CRITERIA:

SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or analyzed independently during another 12-hour analysis period. ☑ YES ☐ NO
2. Were 8260C minimum Relative Response Factor (RRF) criteria met? *Refer to Table 4- SW-846 Method 8260C (Rev3 2/06) for specific analyte RRFs* ☑ YES ☐ NO
3. Did the target analytes and system monitoring analytes (surrogates) have the % D within ± 20%? ☑ YES ☐ NO
   If "NO", list analytes that exceed these criteria:

Draper Aden Associates Contractual Requirements:

1. Did the target analytes and system monitoring analytes (surrogates) have % Ds within ± 20%? ☑ YES ☐ NO

Comments: The CV standard criteria were met.

G. BLANK CRITERIA:

1. Was a method blank analyzed after the calibration standards, prior to sample analysis, and once for every 12-hour period beginning with the injection of BFB? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☑ YES ☐ NO
3. Were the trip blanks and method blanks interference free? ☐ YES ☑ NO
4. Was the level of blank contamination less than 5% of the regulatory limit associated with an analyte or less than 5% of the sample result for the same analyte, whichever is greater? ☑ YES ☐ NO
5. List target analytes detected in the blanks: none
6. Did any result exceed the calibration range? ☐ YES ☑ NO
7. Were one or more blanks analyzed following the high concentration sample to prevent cross contamination? ☑ NA ☐ YES ☐ NO

Comments: A trip blank was submitted and analyzed for each day of sample collection. Blank criteria were met.

H. SURROGATE CRITERIA:

SW-846 Criteria:

1. Were the following surrogates used? ☑ YES ☐ NO
   - dibromofluoromethane (80-120%)
   - 4-bromofluorobenzene (80-120%)
   - toluene-d8 (80-120%)
   - 1,2-dichloroethane-d4 (80-120%)

2. Were recoveries within specified ranges? ☑ YES ☐ NO
   If "NO", corrective action is required. Flagging of the data as estimated is not acceptable until corrective action has been attempted
3. Were samples with surrogates outside the QC window reanalyzed as required? ☑ NA ☐ YES ☐ NO

Comments: Surrogate criteria were met.

I. MATRIX SPIKE, MATRIX SPIKE DUPLICATE (MS/MSD) CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Analyte	*% R Water*	*% RPD Water*
1,1-dichloroethene	61-145	14
trichloroethene	71-120	14
benzene	76-127	11
toluene	76-125	13
chlorobenzene	75-130	13

1. Was a MS/MSD analyzed per sample batch or every 20 samples? ☑ YES ☐ NO
2. Did the MS/MSD spike contain additional target analytes? ☑ YES ☐ NO
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. List the MS % recovery range: 75-125%; 70-130% poor purge analytes; RPD ≤20
5. Were any analytes qualified as estimated? ☑ YES ☐ NO
   - If yes, and the LCS for the analyte(s) recovered within control limits, matrix interference is suspected.

Comments: MS/MSD criteria were met except as noted above.

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain the required target analytes? ☑ YES ☐ NO
3. List the LCS acceptance criteria: 80-120% (most analytes).
4. List the LCS analytes which were not within the specified ranges: *None*
5. Were any analytes flagged as estimated due to LCS criteria? ☐ YES ☑ NO

Comments: LCS criteria were met or no qualifications were needed.

K. INTERNAL STANDARDS (IS) CRITERIA:

1. Were the following internal standards (IS) used? ☑ YES ☐ NO
   t-butyl alcohol-d10, fluorobenzene, chlorobenzene-d_5, 1,4-dichlorobenzene-d_4
2. Were IS areas within - 50% to + 100% of the last CV? ☑ YES ☐ NO
3. Were IS RTs within ± 30 seconds of the last CV? ☑ YES ☐ NO
4. Were samples failing Items 2 and/or 3 above reanalyzed as required by the method? ☑ NA ☐ YES ☐ NO

Comments: Internal standards criteria were met.

L. TARGET ANALYTE IDENTIFICATION:

1. Were the RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT? ☑ YES ☐ NO
2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met:
   * Did characteristic ions maximize in the same scan or within one scan of each other? ☑ YES ☐ NO
   * Were the characteristic ions present in the standard spectra and sample spectra for analytes detected above the QL? ☑ YES ☐ NO
   * Were the relative intensities of the ions between the standard and sample spectra within ± 30%? ☑ YES ☐ NO
3. Were the reported analytes confirmed? ☑ YES ☐ NO

Comments: See attached table for detected analytes. Identification criteria were met.

M. TARGET ANALYTE QUANTITATION:

* If the %RSD of an analyte was 20% or less, then the average relative response factor should have been used for quantitation.
* If the %RSD of an analyte was greater than 20%, then the quantitation should have been based on a calibration curve using the first or higher order regression fit of the five calibration points. (6 calibration points for 2nd order).

1. List the detected analytes whose %RSD was > 20%: *None.*
   - Was quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
2. Did the initial analysis of any sample have a concentration of a analyte which exceeded the initial calibration range? ☐ YES ☑ NO
   If so, was the sample reanalyzed at a higher dilution? ☑ NA ☐ YES ☐ NO
3. Were the analyte concentrations that were recorded on the instrument data/quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO
4. Were sample/ field duplicate RPDs <20% where applicable? ☑ YES ☐ NO

Comments: Target analyte quantitation criteria were met. Calculation checks were performed on ten percent of the data set and no errors were noted.

N. CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: No corrective action was taken. Library searches were not requested. The IDOC for analyst K. Sposito was provided previously.

REFERENCES:

Draper Aden Associates conducted data validation of the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data validation was conducted in general accordance with SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates) and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 and USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008, where applicable). Validation of this data set is limited to the items detailed in this report.

LIMITATIONS:

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SW-846 METHOD 8270D SEMIVOLATILE ORGANIC DATA REVIEW SUMMARY

Draper Aden Associates performed a comprehensive manual review of the analytical results for the April 20-21, 2015 Corrective Action groundwater monitoring event at Hazardous Waste Management Unit 5 (HWMU 5) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected the groundwater samples from point of compliance (POC) monitoring wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23. Sample 5WDUP was submitted to the laboratory as a blind sample duplicate for 5WC21.

Samples were analyzed for the seven Appendix K semivolatile target analytes listed in the facility's permit by USEPA SW-846 Method 8270D. The following information and attached table summarize the Method 8270D data validation results. Other wells were listed on the chain of custody (COC); however, USEPA SW-846 Method 8270D was not required for those sample locations.

Draper Aden Associates sent samples to CompuChem (CompuChem), a Division of Liberty Analytical, of Cary, North Carolina. CompuChem performed the Method 8270D analyses. On behalf of RFAAP, CompuChem submitted results to Draper Aden Associates in a final certificate of analysis, which included sample analytical results, as well as relevant documentation to validate and verify the results. CompuChem is a VELAP accredited laboratory for the parameters, method and matrix as reported on the certificate of analysis.

The evaluation of CompuChem's compliance with Method 8270D and validation of the results was based on a limited review of the following items: QC deliverables package, QC history documentation, case narrative, technical holding time and preservation requirements, instrument performance (tune) check, instrument calibrations, blank analysis, surrogate spike recoveries, matrix spike and matrix spike duplicate (MS/MSD) analyses, laboratory control sample (LCS) data, and internal standard requirements. A review of transcriptions from instrument data to sample summary sheets was performed. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

CompuChem received the samples on ice and in good condition, with custody seals intact. The chain of custody (COC) was appropriately signed and dated by field and laboratory personnel, except as noted. The laboratory's courier inadvertently signed the chain of custody at 10:30 instead of 10:35. The field personnel was present at the sample exchange and noted the time. No data qualification was necessary.

The original certificate of analysis was received on May 11, 2015. The original certificate of analysis appeared complete and data were of acceptable quality, except where noted below. The data set demonstrated the laboratory's ability to achieve the reported permit required quantitation limit (QL).

QC history documentation (instrument specific initial demonstration of proficiency and method detection limit data) were provided. Applicable preservation and technical holding time criteria were met. Instrument performance check (tuning) criteria, initial calibration, calibration

verification, blank, MS/MSD, LCS, surrogate recoveries, and internal standard requirements were met, except where noted below. Sample results were reviewed for transcription errors from the instrument data to the laboratory report and no errors were noted. Deviations from specific QA/QC criteria that were identified during the review process are summarized below. Calculations checks were performed on ten percent of the data set, where applicable. Field duplicate/sample results exhibited acceptable precision, where applicable.

For the initial calibration, the percent relative standard deviation (%RSD) for 2,4-dinitrotoluene was < 20, however, the laboratory used linear regression to report this analyte. No data qualification was required.

A footnote presented in Appendix K, Groundwater Corrective Action Annual Monitoring List, of Permit Module VI – *Groundwater Corrective Action & Monitoring Program for Unit 5* indicates that verification is required for constituents detected at concentrations less than the Limit of Quantitation (LOQ)/QL if their associated groundwater protection standard (GPS) are:

(1) based on background values equal to the QL/LOQ/PQL
(2) greater than the applicable risk-based concentrations (i.e., ACL or RBC).

During Second Quarter 2015, no constituent with a GPS based on a background value equal to the QL/LOQ/PQL was detected at or above the detection limit or QL in any project sample and the alternate low-level analytical method of analysis for confirmation was not required. This applied to nitrobenzene and p-nitroaniline only.

Except where noted above, results remain as reported by the laboratory. Sample results were reported by the laboratory to at or above the method detection limit (MDL) for this monitoring event. These current laboratory established MDLs slightly differ from the MDL listed in Appendix K of the permit.

Target analytes detected at or above the MDL or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table.

Results for samples unaffected by the data validation process and reported as not detected at or above the MDL/detection limit (DL) were validated and qualified "U." Reported values less than the QL should be considered estimated concentrations and were validated and qualified "J." No results were rejected based on the data validation criteria.

SW-846 METHOD 8270D (GC/MS) SEMIVOLATILE ORGANIC DATA VALIDATION

CompuChem, Division of Liberty Analytical, Cary, NC; SDG: 1504088

Comments: *Semivolatile (a.k.a, base/neutral and acid extractables) analysis involves sample preparation using liquid/liquid extraction technique (SW-846 Method 3510C). The semivolatile extracts are concentrated through evaporation. Target analytes are separated and quantified using a capillary column gas chromatograph (GC)/mass spectrometer (MS).*

A. QC DELIVERABLES PACKAGE:

1. Was the case narrative present/signed by a lab representative? ☑ YES ☐ NO
2. Was the Chain of Custody present/signed by a lab representative? ☑ YES ☐ NO
3. Were the sample results included for the sample locations? ☑ YES ☐ NO
4. Did the data correspond to the project specific analyte list? ☑ YES ☐ NO
5. Were the analyte QLs reported on sample summary sheets in agreement with the instrument specific MDL study? ☑ YES ☐ NO

Comments: QC deliverables package criteria were met.

B. QC HISTORY DOCUMENTATION CRITERIA:

1. Were instrument specific detection limits provided for the analytes? ☑ YES ☐ NO
2. Were the instrument specific QLs for target analytes provided? ☑ YES ☐ NO
3. Was calibration range specified for the target analytes? ☑ YES ☐ NO

Comments: QC history documentation criteria were met.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1. Was the 7-day sample collection to extraction holding time met? ☑ YES ☐ NO
2. Was the 40-day extraction to analysis holding time met? ☑ YES ☐ NO
3. Were the samples received at $\leq 6^{\circ}C$? ☑ YES ☐ NO

Comments: Sample holding times and preservation criteria were met.

D. GC/MS INSTRUMENT PERFORMANCE CHECK CRITERIA:
(Tuning, Injection Port and Column Performance)

1. Was performance check solution analysis performed at the beginning of each 12-hour period of standard and/or sample analysis? ☑ YES ☐ NO
2. Was there documentation of the injection of 50 ng of DFTPP? ☑ YES ☐ NO
3. Were the ion abundance criteria met? ☑ YES ☐ NO
4. Was the injection port inertness verified by analysis of 4,4'-DDT? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was the injection port inertness check acceptable? ☑ YES ☐ NO

5. Was column performance checked through the analysis of peak tailing of pentachlorophenol and benzidine? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was column performance check acceptable? ☑ YES ☐ NO

Comments: Instrument performance check criteria were met. Per the laboratory, 50 ng of DFTPP was injected.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1. Were the initial calibrations (ICAL) and any directly associated blanks and samples analyzed within 12-hours of the associated instrument performance (tune) check? ☑ YES ☐ NO
2. Were quantitation ions, used and listed on data, randomly checked against primary quantitation ions as required by Method 8270D and the RFP? ☑ YES ☐ NO
3. Were the target analytes included in the ICAL? ☑ YES ☐ NO
4. Did the ICAL consist of a minimum of 5 calibration levels? ☑ YES ☐ NO
5. Was the lowest concentration calibration standard at or below the associated MCL, regulatory compliance, or action limit? ☑ YES ☐ NO
6. Were calibration levels removed from the curve that would negatively impact the data integrity? ☐ YES ☑ NO
7. Were 8270D minimum RRF criteria met? Relative Response Factor-range (RRF 0.010-0.900) ☑ YES ☐ NO
   **Refer to Table 4 of SW-846 Method 8270D (Rev4 2/07) for specific analyte RRFs*
8. Was each target analyte %RSD ≤ 20%? See comment
9. Was the correlation coefficient or coefficient of determination >0.99 for target analytes with > 20% RSD? ☑ YES ☐ NO
   **System recalibrated if > 10% analytes fail above condition*
10. Was an initial calibration verification (ICV) standard analyzed immediately following the ICAL? ☑ YES ☐ NO
11. Was the recovery within 70-130%? ☑ YES ☐ NO
12. Was the ICV standard prepared from a different source from the ICAL ? ☑ YES ☐ NO

Method Validation Performance Criteria:

1. Did target analytes and surrogates that have RSDs > 20% have ≥0.99 correlation coefficient or coefficient of determination? ☑ YES ☐ NO
2. For linear regression curves, was the recalculated concentration of the low calibration point within ±30%? ☑ YES ☐ NO
3. For quadratic curves, was a minimum six standards used? ☑ NA ☐ YES ☐ NO

Comments: Initial calibration criteria were met. The %RSD for 2,4-dinitrotoluene was < 20; however, linear regression was used to report this analyte. No qualifications were needed.

F. CALIBRATION VERIFICATION CRITERIA:

SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or run independently on another 12-hour analysis period. ☑ YES ☐ NO
2. Was each target analyte % difference/drift ≤ 20%? ☑ YES ☐ NO
   (Corrective action if >20%)
3. Were 8270D minimum RRF criteria met?
   Relative Response Factor-range (RRF 0.010-0.900) ☑ YES ☐ NO
   **Refer to Table 4 of SW-846 Method 8270D (Rev4 2/07) for specific analyte RRFs*

Method Validation Performance Criteria:

1. Did target analytes and system monitoring analytes (surrogates) have % Ds within ± 20.0%? ☑ YES ☐ NO
   If "NO", list analytes that exceed this criterion: see attached table

Comments: Calibration verification criteria were met.

G. BLANK CRITERIA:

1. Was a method/extraction blank analyzed on each GC/MS system used for sample analysis? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☑ NA ☐ YES ☐ NO
3. Were the blank samples interference free? ☑ YES ☐ NO
4. Was the level of blank contamination > 5% of the MCL? ☑ NA ☐ YES ☐ NO
5. List target analytes detected in the blanks: none

Comments: Blank criteria were met.

H. SURROGATE CRITERIA:

1. Were the following surrogates used? See comment
   - phenol - d_6 (10%-94%)
   - 2-fluorophenol (21%-100%)
   - 2,4,6-tribromophenol (10%-123%)
   - nitrobenzene – d_8 (35%-114%)
   - 2-fluorobiphenyl (43%-116%)
   - p-terphenyl - d_{14} (33%-141%)
2. Were recoveries within the specified ranges? ☐ YES ☑ NO
3. Were any two base/neutral or acid surrogates out of specification or did any one base/neutral or acid extractable surrogate have a recovery of less than 10%? ☐ YES ☑ NO
   If yes, was a reextraction and reanalysis performed to confirm that the non-compliance was due to sample matrix effects rather than laboratory deficiencies?

Comments: The laboratory made surrogate substitutions as allowed by the method. The surrogate criteria were met or no data qualifications were needed.

I. MATRIX SPIKE/ MATRIX SPIKE DUPLICATE (MS/MSD) CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Analyte	% R Water	% RPD Water
Phenol	12-110	42
2-Chlorophenol	27-123	40
N-Nitroso-di-n-propylamine	41-116	38
4-Chloro-3-methylphenol	23-97	42
Acenaphthene	46-118	31
4-Nitrophenol	10-80	50
2,4-Dinitrotoluene	24-96	38
Pyrene	26-127	31

1. Was a MS/MSD analyzed per sample batch or every 20 samples, whichever may occur first? ☑ YES ☐ NO
2. Did the MS/MSD spike contain additional target analytes? ☑ YES ☐ NO
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. List the MS % recovery range: *See certificate of analysis*
5. Were any analytes qualified as estimated? ☐ YES ☑ NO
   - If yes, and the LCS for the analyte(s) recovered within control limits, matrix interference is suspected.

Comments: MS/MSD criteria were met. Field duplicate/sample results exhibited acceptable precision, where applicable.

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain required target analytes? ☑ YES ☐ NO
3. List the LCS target analytes and laboratory recovery range: *See semivolatile certificate of analysis.*
4. Were any analytes qualified as estimated due to LCS criteria? ☐ YES ☑ NO

Comments: LCS criteria were met.

K. INTERNAL STANDARDS (IS) CRITERIA:

1. Were the following internal standards used? ☑ YES ☐ NO
   - 1,4-Dichlorobenzene-d_4
   - Naphthalene-d_8
   - Acenapththene-d_{10}
   - Phenanthrene-d_{10}
   - Chrysene-d_{12}
   - Perylene-d_{12}
2. Were the IS areas within - 50% to + 100% of the last CV? ☑ YES ☐ NO
3. Were IS RTs within ± 30 seconds of last CV? ☑ YES ☐ NO

Comments: Internal standard criteria were met.

L. TARGET ANALYTE IDENTIFICATION:

1. Were the RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT? ☑ YES ☐ NO
2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met: ☑ YES ☐ NO
   * Did characteristic ions maximize in the same scan or within one scan of each other?
   * Were characteristic ions present in the standard spectra present in the sample spectra for analytes detected above the QL?
   * Were the relative ion intensities between the standard and sample spectra within ± 30%?
3. Were the reported analytes confirmed? ☑ YES ☐ NO

Comments: Target analyte identification criteria were met.

M. TARGET ANALYTE QUANTITATION:

* If the %RSD of an analyte was 20% or less, then the average relative response factor should have been used for quantitation.
* If the %RSD of an analyte was greater than 20%, then the quantitation should be based on a calibration curve using the first or higher order regression fit of the five calibration points (6 calibration points for 2nd order).

1. List the analytes detected above the QL whose %RSD was >20%: *none*
   a. Was quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
   b. Was the curve forced through the origin? ☑ NA ☐ YES ☐ NO
2. Did the initial analysis of any sample have a concentration of a target analyte that exceeded the initial calibration range? ☐ YES ☑ NO
   -If so, was the sample reanalyzed at a higher dilution? ☑ NA ☐ YES ☐ NO
3. Were the analyte concentrations that were recorded on the raw sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO

Comments: Target analyte quantitation criteria were met. Calculations checks were performed on ten percent of the data set, where applicable.

N. CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: No corrective action was required. Library searches were not requested with this data set. The IDOC for analyst OWS was submitted previously.

REFERENCES:

Draper Aden Associates conducted data validation of the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data validation was conducted in general accordance with SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates) and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 and USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008, where applicable). Validation of this data set is limited to the items detailed in this report.

LIMITATIONS:

Draper Aden Associates prepared this document (which may include drawings, specifications, reports, studies and attachments) in accordance with the agreement between Draper Aden Associates and BAE Systems, Ordnance Systems, Inc. The standard of care for all professional engineering, environmental and surveying and related services performed or furnished by Draper Aden Associates under this Agreement are the care and skill ordinarily used by members of these professions practicing under similar circumstances at the same time and in the same locality. Draper Aden Associates makes no warranties, express or implied, under this Agreement in connection with Draper Aden Associates' services. Conclusions presented are based upon a review of available information, the results of our field studies, and/or professional judgment. To the best of our knowledge, information provided by others is true and accurate, unless otherwise noted. Draper Aden Associates' liability, hereunder, shall be limited to amounts due Draper Aden Associates for services actually rendered, or reimbursable expenses actually incurred. Any reuse or modification of any of the aforementioned documents (whether hard copies or electronic transmittals) prepared by Draper Aden Associates without written verification or adaptation by Draper Aden Associates will be at the sole risk of the individual or entity utilizing said documents and such use is without the authorization of Draper Aden Associates. Draper Aden Associates shall have no legal liability resulting from any and all claims, damages, losses, and expenses, including attorney's fees arising out of the unauthorized reuse or modification of these documents. Client shall indemnify Draper Aden Associates from any claims arising out of unauthorized use or modification of the documents whether hard copy or electronic.

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Date:

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
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Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 6020A		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Antimony	2	0.4
Arsenic	10	2
Barium	10	1
Beryllium	1	0.2
Cadmium	1	0.2
Chromium	5	1
Cobalt	5	1
Copper	5	1
Lead	1	0.2
Nickel	10	2
Selenium	5	3
Silver	1	0.2
Thallium	1	0.2
Vanadium	10	1
Zinc	10	3
Method: 7470A		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Mercury	2	0.2

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8260C		
Laboratory: ELLE, Lancaster, PA		
Acetone	10	3
Acetonitrile	100	32
Acrolein	25	5
Acrylonitrile	10	1
Allyl chloride	10	0.8
Benzene	1	0.1
Bromodichloromethane	1	0.1
Bromoform	1	0.1
2-Butanone	10	1
Carbon disulfide	10	0.4
Carbon tetrachloride	1	0.2
Chloroethane	1	0.1
Chloroform	1	0.1
Chloroprene	10	0.5
Dibromochloromethane	1	0.1
1,2-Dibromo-3-chloropropane	1	0.2
1,2-Dibromoethane	1	0.1
1,2-Dichlorobenzene	1	0.1
1,3-Dichlorobenzene	1	0.1
1,4-Dichlorobenzene	1	0.1
trans-1,4-Dichloro-2-butene	10	1
Dichlorodifluoromethane	1	0.1
1,1-Dichloroethane	1	0.1
1,2-Dichloroethane	1	0.1
1,1-Dichloroethene	1	0.2
trans-1,2-Dichloroethene	1	0.2
1,2-Dichloropropane	1	0.1
1,3-Dichloropropane	1	0.1
trans-1,3-Dichloropropene	1	0.1
Diethyl ether	13	11
Dimethyl ether	13	0.1
1,4-Dioxane	200	45
Ethylbenzene	1	0.1
Ethyl methacrylate	10	0.8
Hexachlorobutadiene	1	0.1
Hexachloroethane	10	0.1
2-Hexanone	10	1
Isobutyl alcohol	200	10
Methacrylonitrile	100	9.8
Bromomethane	1	0.5
Chloromethane	1	0.2
Iodomethane	10	0.6
Methyl methacrylate	10	3.6
4-Methyl-2-pentanone	10	1
Dibromomethane	1	0.1
Methylene chloride	1	0.2
Naphthalene	1	0.1
Pentachloroethane	10	0.8
2-Propanol	100	50
Propionitrile	100	10

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8260C		
Laboratory: ELLE, Lancaster, PA		
Styrene	1	0.1
1,1,1,2-Tetrachloroethane	1	0.1
1,1,2,2-Tetrachloroethane	1	0.2
Tetrachloroethene	1	0.1
Tetrahydrofuran	25	2
Toluene	1	0.1
1,2,4-Trichlorobenzene	1	0.1
1,1,1-Trichloroethane	1	0.1
1,1,2-Trichloroethane	1	0.1
Trichloroethene	1	0.2
Trichlorofluoromethane	1	0.2
1,2,3-Trichloropropane	1	0.3
1,1,2-Trichloro-1,2,2-Trifluoroethane	1	0.2
Vinyl acetate	10	3.3
Vinyl chloride	1	0.2
Xylenes (Total)	3	0.2

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8270D		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Acenaphthene	5	0.8
Acenaphthylene	5	0.96
Acetophenone	5	1.2
2-Acetylaminofluorene	5	0.82
4-Aminobiphenyl	5	0.35
Aniline	5	1.8
Anthracene	5	0.77
Aramite	5	0.84
Benzo[a]anthracene	5	0.57
Benzo[b]fluoranthene	5	0.68
Benzo[k]fluoranthene	5	1.5
Benzo[ghi]perylene	5	0.61
Benzo(a)pyrene	5	0.7
1,4-Benzenediamine	10	1.5
Benzyl alcohol	5	1.1
bis(2-Chloroethoxy)methane	5	0.99
bis(2-Chloroethyl)ether	5	1.3
bis(2-Chloro-1-methylethyl)ether	5	1.6
bis(2-Ethylhexyl)phthalate	5	0.57
4-Bromophenyl phenyl ether	5	0.8
Butyl benzyl phthalate	5	0.55
p-Chloroaniline	10	1.1
Chlorobenzilate	5	0.34
p-Chloro-m-cresol	10	0.82
2-Chloronaphthalene	5	1
2-Chlorophenol	10	1.4
4-Chlorophenyl phenyl ether	5	0.66
Chrysene	5	2.2
Diallate	10	0.92
Dibenz(a,h)anthracene	5	0.74
Dibenzofuran	5	0.76
Di-n-butyl phthalate	5	0.74
3,3'-Dichlorobenzidine	5	1.4
2,4-Dichlorophenol	10	1.6
2,6-Dichlorophenol	10	0.42
Diethyl phthalate	5	0.52
O,O-Diethyl O-2-pyrazinyl	5	0.75
Dimethoate	5	0.39
p-(Dimethylamino)azobenzene	5	0.47
7,12-Dimethylbenz[a]anthracene	5	0.31
3,3'-Dimethylbenzidine	5	1.4
a,a-Dimethylphenethylamine	15	3.8
2,4-Dimethylphenol	10	4.8
Dimethyl phthalate	5	0.64
m-Dinitrobenzene	5	1.1
4,6-Dinitro-o-cresol	10	1.1
2,4-Dinitrophenol	10	2.1
2,4-Dinitrotoluene	5	0.84
2,6-Dinitrotoluene	5	0.75
Di-n-octyl phthalate	5	0.71

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8270D		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Diphenylamine	5	0.97
Disulfoton	5	0.45
Ethyl methanesulfonate	5	1.1
Famphur	5	0.59
Fluoranthene	5	0.58
Fluorene	5	0.71
Hexachlorobenzene	5	0.57
Hexachlorocyclopentadiene	5	0.91
Hexachloroethane	5	1.1
Hexachlorophene	100	40
Hexachloropropene	5	0.5
Indeno[1,2,3-cd]pyrene	5	0.64
Isodrin	5	0.52
Isophorone	5	0.94
Isosafrole	5	0.47
Kepone	5	0.54
Methapyrilene	5	1.4
3-Methylcholanthrene	5	0.26
Methyl methane sulfonate	5	0.78
2-Methylnaphthalene	5	1.1
Methyl parathion	5	0.52
2-Methylphenol	10	2.2
3 & 4-Methylphenol	10	1.7
1,4-Naphthoquinone	5	0.28
1-Naphthylamine	5	0.59
2-Naphthylamine	5	0.45
o-Nitroaniline	10	1.5
m-Nitroaniline	10	0.83
p-Nitroaniline	10	2.7
Nitrobenzene	5	1.3
o-Nitrophenol	10	0.99
p-Nitrophenol	10	2.3
4-Nitroquinoline-1-oxide	5	0.54
N-Nitrosodi-n-butylamine	5	0.57
N-Nitrosodiethylamine	5	0.78
N-Nitrosodimethylamine	5	0.98
N-Nitrosodiphenylamine	5	0.97
N-Nitrosodipropylamine	5	1.8
N-Nitrosomethylethylamine	5	0.99
N-Nitrosomorpholine	5	0.85
N-Nitrosopiperidine	5	0.35
N-Nitrosopyrrolidine	5	0.61
5-Nitroso-o-toluidine	5	0.37
Parathion	5	0.43
Pentachlorobenzene	5	0.75
Pentachloronitrobenzene	5	0.44
Pentachlorophenol	10	2.6
Phenacetin	5	0.38
Phenanthrene	5	0.7
Phenol	10	0.62

Summary of Quantitation Limits and Detection Limits
Radford Army Ammunition Plant (RFAAP), Radford, VA
Appendix IX Monitoring Event
Monitoring Event: Second Quarter 2015

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Analyte	Quantitation Limit/QL (ug/L)	Detection Limit/DL (ug/L)
Method: 8270D		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Phorate	5	0.47
2-Picoline	5	0.74
Pronamide	5	0.27
Pyrene	5	0.73
Pyridine	5	1.1
Safrole	5	0.37
Sulfotep	5	0.52
1,2,4,5-Tetrachlorobenzene	5	1.9
2,3,4,6-Tetrachlorophenol	10	0.7
o-Toluidine	5	0.46
2,4,5-Trichlorophenol	10	1.5
2,4,6-Trichlorophenol	10	0.89
O,O,O-Triethyl phosphorothioate	5	0.57
sym-Trinitrobenzene	5	0.42
Method: 9012B		
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC		
Cyanide	20	4

Comprehensive Data Validation Report

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Radford Army Ammunition Plant (RFAAP), Radford, Virginia

Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-16 Monitoring Event: Second Quarter 2015

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Barium	16WC1A	257		257		10	No action taken.
	16WDUP	253		253		10	No action taken.
Cobalt	16WDUP	5.96		5.96		5	No action taken.
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1-Dichloroethane	16WC1A	2.4		2.4		1	No action taken.
	16WDUP	2.2		2.2		1	No action taken. Field duplicate of 16WC1A.
Diethyl ether	16WC1A	14		14	J	13	MS recovered low (69%).
	16WDUP	13		13	J	13	MS recovered low (69%). Field duplicate of 16WC1A.

Definitions:
Data Validation Qualifiers:
QL Denotes permit quantitation limit. Q Denotes data qualifier.
J Denotes analyte reported at or above quantitation limit and associated result is estimated.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Antimony	16C1	0.4	U	U		2	Analyte not detected at or above QL or DL.
	16MW8	0.4	U	U		2	Analyte not detected at or above QL or DL.
	16MW9	0.4	U	U		2	Analyte not detected at or above QL or DL.
	16WC1A	0.4	U	U		2	Analyte not detected at or above QL or DL.
	16WC1B	0.4	U	U		2	Analyte not detected at or above QL or DL.
	16WDUP	0.4	U	U		2	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Arsenic	16C1	2	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	2	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	2	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	2	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	2	U	U		10	Analyte not detected at or above QL or DL.
	16WC2B	0.14	U	U		10	Analyte not detected at or above QL.
	16-2	0.14	U	U		10	Analyte not detected at or above QL.
	16-3	0.14	U	U		10	Analyte not detected at or above QL.
	16-5	0.14	U	U		10	Analyte not detected at or above QL.
	16SPRING	0.14	U	U		10	Analyte not detected at or above QL.
	16WDUP	2	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Barium	16C1	167		167		10	No action taken.
	16MW8	139		139		10	No action taken.
	16MW9	561		561		10	Analyzed in dilution (1:2). Actual QL 20 ug/l.
	16WC1A	257		257		10	No action taken.
	16WC1B	130		130		10	No action taken.
	16WC2B	116		116		10	No action taken.
	16-2	207		207		10	No action taken.
	16-3	695		695		10	Analyzed in dilution (1:2). Actual QL 20 ug/l.
	16-5	163		163		10	No action taken.
	16SPRING	195		195		10	No action taken.
	16WDUP	253		253		10	No action taken. Field duplicate of 16WC1A.
Beryllium	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.341	J	0.341	J	1	Result < QL. MSD recovered high (127%).
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Beryllium	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	0.033	U	U		1	Analyte not detected at or above QL.
	16-2	0.033	U	U		1	Analyte not detected at or above QL.
	16-3	0.033	U	U		1	Analyte not detected at or above QL.
	16-5	0.033	U	U		1	Analyte not detected at or above QL.
	16SPRING	0.033	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Cadmium	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.235	J	0.235	J	1	Result < QL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.251	J	0.251	J	1	Result < QL.
	16WC2B	0.011	U	U		1	Analyte not detected at or above QL.
	16-2	0.011	U	U		1	Analyte not detected at or above QL.
	16-3	0.011	U	U		1	Analyte not detected at or above QL.
	16-5	0.011	U	U		1	Analyte not detected at or above QL.
	16SPRING	0.011	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chromium	16C1	1	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	1	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC2B	0.068	U	U		5	Analyte not detected at or above QL.
	16-2	0.068	U	U		5	Analyte not detected at or above QL.
	16-3	0.068	U	U		5	Analyte not detected at or above QL.
	16-5	0.068	U	U		5	Analyte not detected at or above QL.
	16SPRING	0.068	U	U		5	Analyte not detected at or above QL.
	16WDUP	1	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Cobalt	16C1	1	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	1.25	J	1.25	J	5	Result < QL.
	16MW9	4.84	J	4.84	J	5	Result < QL. Verification event May 26, 2015. Verfication result reported. Original result 5.3 ug/l.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Cobalt	16WC1A	4.3	J	4.3	J	5	Result < QL. Verification event May 26, 2015. Verfication result reported. Original result 5.8 ug/l.
	16WC1B	22.3		22.3		5	No action taken.
	16WC2B	0.0095	U	U		5	Analyte not detected at or above QL.
	16-2	0.0095	U	U		5	Analyte not detected at or above QL.
	16-3	0.0095	U	U		5	Analyte not detected at or above QL.
	16-5	0.0095	U	U		5	Analyte not detected at or above QL.
	16SPRING	0.0095	U	U		5	Analyte not detected at or above QL.
	16WDUP	5.96		5.96		5	No action taken. Field duplicate of 16WC1A.
Copper	16C1	1	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	16.9		16.9		5	No action taken.
	16MW9	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	1	U	U		5	Analyte not detected at or above QL or DL.
	16WC2B	0.12	U	U		5	Analyte not detected at or above QL.
	16-2	0.12	U	U		5	Analyte not detected at or above QL.
	16-3	0.12	U	U		5	Analyte not detected at or above QL.
	16-5	0.12	U	U		5	Analyte not detected at or above QL.
	16SPRING	0.12	U	U		5	Analyte not detected at or above QL.
	16WDUP	1	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Lead	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.769	J	0.769	J	1	Result < QL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	0.021	U	U		1	Analyte not detected at or above QL.
	16-2	0.021	U	U		1	Analyte not detected at or above QL.
	16-3	0.021	U	U		1	Analyte not detected at or above QL.
	16-5	0.021	U	U		1	Analyte not detected at or above QL.
	16SPRING	0.021	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Nickel	16C1	4.99	J	4.99	J	10	Result < QL.
	16MW8	4.21	J	4.21	J	10	Result < QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Nickel	16MW9	18.7		18.7		10	No action taken.
	16WC1A	8.44	J	8.44	J	10	Result < QL.
	16WC1B	7	J	7	J	10	Result < QL.
	16WC2B	0.0091	U	U		10	Analyte not detected at or above QL.
	16-2	0.0091	U	U		10	Analyte not detected at or above QL.
	16-3	0.0091	U	U		10	Analyte not detected at or above QL.
	16-5	0.0091	U	U		10	Analyte not detected at or above QL.
	16SPRING	0.0091	U	U		10	Analyte not detected at or above QL.
	16WDUP	8.61	J	8.61	J	10	Result < QL. Field duplicate of 16WC1A.
Selenium	16C1	3	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	3	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	3	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	3	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	3	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	3	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Silver	16C1	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%)
	16MW8	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%)
	16MW9	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%)
	16WC1A	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%)
	16WC1B	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%)
	16WDUP	0.2	U	U	J	1	Analyte not detected at or above QL or DL. MS/MSD recovered low. (68.8/70.9%). Field duplicate of 16WC1A.
Thallium	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Vanadium	16C1	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Vanadium	16WC1B	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC2B	0.056	U	U		10	Analyte not detected at or above QL.
	16-2	0.056	U	U		10	Analyte not detected at or above QL.
	16-3	0.056	U	U		10	Analyte not detected at or above QL.
	16-5	0.056	U	U		10	Analyte not detected at or above QL.
	16SPRING	0.056	U	U		10	Analyte not detected at or above QL.
	16WDUP	1	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Zinc	16C1	3.13	J	3.13	J	10	Result < QL.
	16MW8	54.9		54.9		10	No action taken.
	16MW9	3	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	5.31	J	5.31	J	10	Result < QL.
	16WC1B	8.29	J	8.29	J	10	Result < QL.
	16WC2B	0.12	U	U		10	Analyte not detected at or above QL.
	16-2	0.12	U	U		10	Analyte not detected at or above QL.
	16-3	0.12	U	U		10	Analyte not detected at or above QL.
	16-5	0.12	U	U		10	Analyte not detected at or above QL.
	16SPRING	0.12	U	U		10	Analyte not detected at or above QL.
	16WDUP	4.43	J	4.43	J	10	Result < QL. Field duplicate of 16WC1A.
Method: 7470A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Mercury	16C1	0.2	U	U		2	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		2	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		2	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		2	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		2	Analyte not detected at or above QL or DL.
	16WC2B	0.2	U	U		2	Analyte not detected at or above QL.
	16-2	0.2	U	U		2	Analyte not detected at or above QL.
	16-3	0.2	U	U		2	Analyte not detected at or above QL.
	16-5	0.2	U	U		2	Analyte not detected at or above QL.
	16SPRING	0.2	U	U		2	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		2	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Acetone	16C1	3	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	3	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	3	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	3	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	3	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	3	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Acetonitrile	16C1	32	U	U		100	Analyte not detected at or above QL or DL.
	16MW8	32	U	U		100	Analyte not detected at or above QL or DL.
	16MW9	32	U	U		100	Analyte not detected at or above QL or DL.
	16WC1A	32	U	U		100	Analyte not detected at or above QL or DL.
	16WC1B	32	U	U		100	Analyte not detected at or above QL or DL.
	16WDUP	32	U	U		100	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Acrolein	16C1	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%).
	16MW8	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%).
	16MW9	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%).
	16WC1A	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%).
	16WC1B	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%).
	16WDUP	5	U	U	J	25	Analyte not detected at or above QL or DL. Aliquot pH <2 SU. CV %D > +/- 20 (-25%). Field duplicate of 16WC1A.
Acrylonitrile	16C1	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	1	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	1	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Allyl chloride	16C1	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.8	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzene	16C1	0.3	J	0.3	J	1	Result < QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Benzene	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.3	J	0.3	J	1	Result < QL.
	16WC1A	0.1	J	0.1	J	1	Result < QL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.1	J	0.1	J	1	Result < QL. Field duplicate of 16WC1A.
Bromodichloromethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Bromoform	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Butanone	16C1	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
2-Butanone	16WDUP	1	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Carbon disulfide	16C1	0.4	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.4	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.4	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.4	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.4	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.4	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Carbon tetrachloride	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chloroethane	16C1	4.9		4.9		1	No action taken.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	2.7		2.7		1	No action taken.
	16WC1A	0.9	J	0.9	J	1	Result < QL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.8	J	0.8	J	1	Result < QL. Field duplicate of 16WC1A.
Chloroform	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Chloroform	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chloroprene	16C1	0.5	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.5	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.5	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.5	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Dibromochloromethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2-Dibromo-3-chloropropane	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2-Dibromoethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2-Dichlorobenzene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,2-Dichlorobenzene	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,3-Dichlorobenzene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,4-Dichlorobenzene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
trans-1,4-Dichloro-2-butene	16C1	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%).
	16MW8	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%).
	16MW9	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%).
	16WC1A	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%).
	16WC1B	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%).
	16WDUP	1	U	U	J	10	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (40%). Field duplicate of 16WC1A.
Dichlorodifluoromethane	16C1	0.2	J	0.2	J	1	Result < QL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	I6WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1-Dichloroethane	16C1	7.6		7.6		1	No action taken.
	16MW8	0.3	J	0.3	J	1	Result < QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1-Dichloroethane	16MW9	7.9		7.9		1	No action taken.
	16WC1A	2.4		2.4		1	No action taken.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	2.2		2.2		1	No action taken. Field duplicate of 16WC1A.
1,2-Dichloroethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1-Dichloroethene	16C1	0.3	J	0.3	J	1	Result < QL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
trans-1,2-Dichloroethene	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,2-Dichloropropane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,3-Dichloropropane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
trans-1,3-Dichloropropene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Diethyl ether	16C1	44		44	J	13	MS recovered low (69%). Analyzed in dilution (1:10). Actual adjusted QL 10 ug/l.
	16MW8	7.7	J	7.7	J	13	Result < QL. MS recovered low (69%).
	16MW9	50		50	J	13	MS recovered low (69%). Analyzed in dilution (1:10). Actual adjusted QL 10 ug/l.
	16WC1A	14		14	J	13	MS recovered low (69%).
	16WC1B	1.1	U	U	J	13	Analyte not detected at or above QL or DL. MS recovered low (69%).
	16WC2B	13	U	U	J	13	Analyte not detected at or above QL. MS recovered low (69%).
	16-2	13	U	U	J	13	Analyte not detected at or above QL. MS recovered low (69%).
	16-3	13	U	U	J	13	Analyte not detected at or above QL. MS recovered low (69%).
	16-5	13	U	U	J	13	Analyte not detected at or above QL. MS recovered low (69%).
	16SPRING	13	U	U	J	13	Analyte not detected at or above QL. MS recovered low (69%).
	16WDUP	13		13	J	13	MS recovered low (69%). Field duplicate of 16WC1A.
Dimethyl ether	16C1	11	J	11	J	13	Result < QL.
	16MW8	0.3	J	0.3	J	13	Result < QL.
	16MW9	1.1	J	1.1	J	13	Result < QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Dimethyl ether	16WC1A	1	J	1	J	13	Result < QL.
	16WC1B	0.2	J	0.2	J	13	Result < QL.
	16WC2B	13	U	U		13	Analyte not detected at or above QL.
	16-2	13	U	U		13	Analyte not detected at or above QL.
	16-3	13	U	U		13	Analyte not detected at or above QL.
	16-5	13	U	U		13	Analyte not detected at or above QL.
	16SPRING	13	U	U		13	Analyte not detected at or above QL.
	16WDUP	1	J	1	J	13	Result < QL. Field duplicate of 16WC1A.
1,4-Dioxane	16C1	45	U	U		200	Analyte not detected at or above QL or DL.
	16MW8	45	U	U		200	Analyte not detected at or above QL or DL.
	16MW9	45	U	U		200	Analyte not detected at or above QL or DL.
	16WC1A	45	U	U		200	Analyte not detected at or above QL or DL.
	16WC1B	45	U	U		200	Analyte not detected at or above QL or DL.
	16WDUP	45	U	U		200	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Ethylbenzene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Ethyl methacrylate	16C1	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.8	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachlorobutadiene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Hexachlorobutadiene	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachloroethane	16C1	0.1	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Hexanone	16C1	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%).
	16MW8	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%).
	16MW9	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%).
	16WC1A	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%).
	16WC1B	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%).
	16WDUP	1	U	U	J	10	Analyte not detected at or above QL or DL. CV %D > +/- 20 (21%). Field duplicate of 16WC1A.
Isobutyl alcohol	16C1	10	U	U		200	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		200	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		200	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		200	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		200	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		200	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methacrylonitrile	16C1	9.8	U	U		100	Analyte not detected at or above QL or DL.
	16MW8	9.8	U	U		100	Analyte not detected at or above QL or DL.
	16MW9	9.8	U	U		100	Analyte not detected at or above QL or DL.
	16WC1A	9.8	U	U		100	Analyte not detected at or above QL or DL.
	16WC1B	9.8	U	U		100	Analyte not detected at or above QL or DL.
	16WDUP	9.8	U	U		100	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Bromomethane	16C1	0.5	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.5	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.5	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Bromomethane	16WC1A	0.5	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.5	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.5	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chloromethane	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Iodomethane	16C1	0.6	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.6	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.6	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.6	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.6	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.6	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methyl methacrylate	16C1	3.6	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	3.6	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	3.6	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	3.6	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	3.6	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	3.6	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4-Methyl-2-pentanone	16C1	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	1	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	1	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	1	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	1	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Dibromomethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methylene chloride	16C1	2.6		2.6		1	No action taken.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Naphthalene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pentachloroethane	16C1	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	0.8	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	0.8	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Propanol	16C1	50	U	U		100	Analyte not detected at or above QL or DL.
	16MW8	50	U	U		100	Analyte not detected at or above QL or DL.
	16MW9	50	U	U		100	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
2-Propanol	16WC1A	50	U	U		100	Analyte not detected at or above QL or DL.
	16WC1B	50	U	U		100	Analyte not detected at or above QL or DL.
	16WDUP	50	U	U		100	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Propionitrile	16C1	10	U	U		100	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		100	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		100	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		100	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		100	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		100	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Styrene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1,1,2-Tetrachloroethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1,2,2-Tetrachloroethane	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Tetrachloroethene	16C1	0.3	J	0.3	J	1	Result < QL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Tetrachloroethene	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Tetrahydrofuran	16C1	14	J	14	J	25	Result < QL.
	16MW8	2	U	U		25	Analyte not detected at or above QL or DL.
	16MW9	2	U	U		25	Analyte not detected at or above QL or DL.
	16WC1A	2	U	U		25	Analyte not detected at or above QL or DL.
	16WC1B	2	U	U		25	Analyte not detected at or above QL or DL.
	16WDUP	2	U	U		25	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Toluene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2,4-Trichlorobenzene	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1,1-Trichloroethane	16C1	0.3	J	0.3	J	1	Result < QL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1,1-Trichloroethane	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1,2-Trichloroethane	16C1	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.1	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.1	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Trichloroethene	16C1	0.3	J	0.3	J	1	Result < QL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Trichlorofluoromethane	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Trichlorofluoromethane	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2,3-Trichloropropane	16C1	0.3	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.3	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.3	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.3	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.3	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.3	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,1,2-Trichloro-1,2,2-Trifluoroethane	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Vinyl acetate	16C1	3.3	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	3.3	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	3.3	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	3.3	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	3.3	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	3.3	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Vinyl chloride	16C1	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		1	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Vinyl chloride	16WC1B	0.2	U	U		1	Analyte not detected at or above QL or DL.
	16WDUP	0.2	U	U		1	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Xylenes (Total)	16C1	0.2	U	U		3	Analyte not detected at or above QL or DL.
	16MW8	0.2	U	U		3	Analyte not detected at or above QL or DL.
	16MW9	0.2	U	U		3	Analyte not detected at or above QL or DL.
	16WC1A	0.2	U	U		3	Analyte not detected at or above QL or DL.
	16WC1B	0.2	U	U		3	Analyte not detected at or above QL or DL.
	16WC2B	3	U	U		3	Analyte not detected at or above QL.
	16-2	3	U	U		3	Analyte not detected at or above QL.
	16-3	3	U	U		3	Analyte not detected at or above QL.
	16-5	3	U	U		3	Analyte not detected at or above QL.
	16SPRING	3	U	U		3	Analyte not detected at or above QL.
	16WDUP	0.2	U	U		3	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Acenaphthene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Acenaphthylene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Acetophenone	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Acetylaminofluorene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4-Aminobiphenyl	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Aniline	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Aniline	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Anthracene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Aramite	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzo[a]anthracene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzo[b]fluoranthene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzo[k]fluoranthene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Benzo[k]fluoranthene	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzo[ghi]perylene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Benzo(a)pyrene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,4-Benzenediamine	16C1	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%).
	16MW8	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%).
	16MW9	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%).
	16WC1A	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%).
	16WC1B	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%).
	16WDUP	10	U	U	J	10	Analyte not detected at or above QL or DL. LCS/LCSD recovered low (6/7%). Field duplicate of 16WC1A.
Benzyl alcohol	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
bis(2-Chloroethoxy)methane	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
bis(2-Chloroethyl)ether	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
bis(2-Chloro-1-methylethyl)ether	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
bis(2-Ethylhexyl)phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4-Bromophenyl phenyl ether	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Butyl benzyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
p-Chloroaniline	16C1	10	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
p-Chloroaniline	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chlorobenzilate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
p-Chloro-m-cresol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Chloronaphthalene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Chlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4-Chlorophenyl phenyl ether	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
4-Chlorophenyl phenyl ether	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Chrysene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Diallate	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Dibenz(a,h)anthracene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Dibenzofuran	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Di-n-butyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Di-n-butyl phthalate	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
3,3'-Dichlorobenzidine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,4-Dichlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,6-Dichlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Diethyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	0.89	J	0.89	J	5	Result < QL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC2B	5	U	U		5	Analyte not detected at or above QL.
	16-2	5	U	U		5	Analyte not detected at or above QL.
	16-3	5	U	U		5	Analyte not detected at or above QL.
	16-5	5	U	U		5	Analyte not detected at or above QL.
	16SPRING	5	U	U		5	Analyte not detected at or above QL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
O,O-Diethyl O-2-pyrazinyl	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
O,O-Diethyl O-2-pyrazinyl	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Dimethoate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
p-(Dimethylamino)azobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
7,12-Dimethylbenz[a]anthracene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
3,3'-Dimethylbenzidine	16C1	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover.
	16MW8	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover.
	16MW9	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover.
	16WC1A	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover.
	16WC1B	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover.
	16WDUP	5	U	U	J	5	Analyte not detected at or above QL or DL. ICV %D > +/- 30 (87.6%). MS/MSD did not recover. Field duplicate of 16WC1A.
a,a-Dimethylphenethylamine	16C1	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover.
	16MW8	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover.
	16MW9	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
a,a-Dimethylphenethylamine	16WC1A	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover.
	16WC1B	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover.
	16WDUP	15	U	U	J	15	Analyte not detected at or above QL or DL. MS recovered low (13%). MSD did not recover. Field duplicate of 16WC1A.
2,4-Dimethylphenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Dimethyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
m-Dinitrobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4,6-Dinitro-o-cresol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,4-Dinitrophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
2,4-Dinitrophenol	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,4-Dinitrotoluene	16C1	5	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	5	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,6-Dinitrotoluene	16C1	5	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		10	Analyte not detected at or above QL or DL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	5	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Di-n-octyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Diphenylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Diphenylamine	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Disulfoton	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Ethyl methanesulfonate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Famphur	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Fluoranthene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Fluorene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Fluorene	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachlorobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachlorocyclopentadiene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachloroethane	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachlorophene	16C1	100	U	U		100	Analyte not detected at or above QL or DL.
	16MW8	100	U	U		100	Analyte not detected at or above QL or DL.
	16MW9	100	U	U		100	Analyte not detected at or above QL or DL.
	16WC1A	100	U	U		100	Analyte not detected at or above QL or DL.
	16WC1B	100	U	U		100	Analyte not detected at or above QL or DL.
	16WDUP	100	U	U		100	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Hexachloropropene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Indeno[1,2,3-cd]pyrene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Isodrin	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Isophorone	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Isosafrole	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Kepone	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methapyrilene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Methapyrilene	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
3-Methylcholanthrene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methyl methane sulfonate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Methylnaphthalene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Methyl parathion	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Methylphenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
2-Methylphenol	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
3 & 4-Methylphenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,4-Naphthoquinone	16C1	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%).
	16MW8	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%).
	16MW9	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%).
	16WC1A	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%).
	16WC1B	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%).
	16WDUP	5	U	U	J	5	Analyte not detected at or above QL or DL. LCS recovered low (9%). MS recovered low (10%). Field duplicate of 16WC1A.
1-Naphthylamine	16C1	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
	16MW8	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
	16MW9	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
	16WC1A	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
	16WC1B	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
	16WDUP	5	U	U	J	5	Analyte not detected at or above QL or DL. MSD recovered low (13%).
2-Naphthylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
o-Nitroaniline	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
o-Nitroaniline	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
m-Nitroaniline	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
p-Nitroaniline	16C1	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%).
	16MW8	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%).
	16MW9	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%).
	16WC1A	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%).
	16WC1B	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%).
	16WDUP	10	U	U	J	10	Analyte not detected at or above QL or DL. MS recovered low (74%). Field duplicate of 16WC1A.
Nitrobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
o-Nitrophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
p-Nitrophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
4-Nitroquinoline-1-oxide	16C1	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
4-Nitroquinoline-1-oxide	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosodi-n-butylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosodiethylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosodimethylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosodiphenylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosodipropylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
N-Nitrosodipropylamine	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosomethylethylamine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosomorpholine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosopiperidine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
N-Nitrosopyrrolidine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
5-Nitroso-o-toluidine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
5-Nitroso-o-toluidine	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Parathion	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pentachlorobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pentachloronitrobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pentachlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Phenacetin	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Phenanthrene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Phenanthrene	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Phenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Phorate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2-Picoline	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pronamide	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pyrene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Pyrene	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Pyridine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Safrole	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
Sulfotep	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
1,2,4,5-Tetrachlorobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,3,4,6-Tetrachlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
2,3,4,6-Tetrachlorophenol	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
o-Toluidine	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,4,5-Trichlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
2,4,6-Trichlorophenol	16C1	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW8	10	U	U		10	Analyte not detected at or above QL or DL.
	16MW9	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL or DL.
	16WC1B	10	U	U		10	Analyte not detected at or above QL or DL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
O,O,O-Triethyl phosphorothioate	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.
sym-Trinitrobenzene	16C1	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW8	5	U	U		5	Analyte not detected at or above QL or DL.
	16MW9	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL or DL.
	16WC1B	5	U	U		5	Analyte not detected at or above QL or DL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 9012B							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Cyanide	16C1	4	U	U		20	Analyte not detected at or above QL or DL.
	16MW8	4	U	U		20	Analyte not detected at or above QL or DL.
	16MW9	4	U	U		20	Analyte not detected at or above QL or DL.
	16WC1A	4	U	U		20	Analyte not detected at or above QL or DL.
	16WC1B	4	U	U		20	Analyte not detected at or above QL or DL.
	16WDUP	4	U	U		20	Analyte not detected at or above QL or DL. Field duplicate of 16WC1A.

Definitions:

Appendix IX monitoring events and compliance monitoring wells:
For Appendix IX monitoring events, all compliance well results evaluated to the project detection limit.
See separate table for Appendix IX monitoring event detection limits.
QLDenotes permit quantitation limit.
Q Denotes data qualifier.
U Denotes analyte not detected at or above laboratory detection limit (DL) or QL.
J Denotes analyte reported at or above laboratory detection limit and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above laboratory detection limit and project required quantitation limit/detection limit is estimated.
UA Denotes analyte not detected at or above adjusted sample detection limit /QL.
UN Denotes analyte concentration is less than the quantitation limit and five times the blank concentration. Analyte was not reliably detected due to blank contamination.
R Denotes result rejected.
Laboratory Data Qualifiers,
"U" and "<", denote not detected at or above the detection limit or QL.
B or J denote result detected between DL and QL, associated value should be considered an estimated concentration.

Appendix IX monitoring events:
Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007, Second Quarter 2008,
Second Quarter 2009, Second Quarter 2010, Second Quarter 2011, Second Quarter 2012, Second Quarter 2013. Second Quarter 2014, Second Quarter 2015

Definitions for Non-Appendix IX Monitoring Events and plume monitoring wells:
QL Denotes permit quantitation limit.
Q Denotes data qualifier.
U Denotes analyte not detected at or above QL.
UA Denotes analyte not detected at or above adjusted sample QL. See data validation report for further explanation.
J Denotes analyte reported at or above QL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA"(i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
R Denotes result rejected. See data validation report for further explanation.
Laboratory Data Qualifiers, "U" and "<", denote not detected at or above the QL.

SW-846 METHODS 6020A & 7470A INORGANIC DATA REVIEW SUMMARY

Draper Aden Associates performed a comprehensive manual review of the analytical results for the April 21-22, 2015 groundwater monitoring event at Hazardous Waste Management Unit 16 (HWMU 16) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected the groundwater samples from monitoring wells 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B, 16-2, 16-3, 16-5, 16WC2B, and 16SPRING. Sample 16WDUP was submitted to the laboratory as a blind sample duplicate for sample 16WC1A. Validation of other required methods is presented on separate reports.

Samples 16C1, 16MW8, 16MW9, 16WC1A and 16WC1B (compliance wells) were analyzed for fifteen (15) metals by SW-846 Method 6020A and mercury by SW-846 Method 7470A. Samples 16-2, 16-3, 16-5, 16WC2B and 16SPRING (plume wells) were analyzed for eleven (11) metals by SW-846 Method 6020A and mercury by SW-846 Method 7470A. The following information and attached table summarize the inorganic data validation results.

Techniques used for metals analysis include inductively coupled plasma ICP-mass spectrometry (ICP-MS) and cold vapor atomic absorption (CVAA). Samples 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B were analyzed for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, selenium, silver, thallium, vanadium and zinc by ICP-MS Method 6020A and mercury by CVAA Method 7470A. The remaining plume monitoring well samples were analyzed for arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc by ICP-MS Method 6020A and mercury by CVAA Method 7470A. Total (T) concentrations were determined for the inorganic (metal) analytes.

Draper Aden Associates sent samples to CompuChem (CompuChem), a Division of Liberty Analytical, of Cary, North Carolina, for the inorganic analyses. On behalf of RFAAP, CompuChem submitted results to Draper Aden Associates in a final certificate of analysis which included sample analytical results as well as relevant documentation to verify and validate the results. CompuChem is a VELAP accredited laboratory for the above analytes, methods and matrix as reported on the certificate of analysis.

The evaluation of CompuChem's compliance with the method and validation of results presented here are based upon a limited review of QA/QC information including holding times, preservation procedures, instrument tuning, calibration and calibration verification data, QL standards, blank samples (method, calibration, and others), interference check sample, pre-digestion matrix spike and matrix spike duplicate (MS/MSD), laboratory control sample (LCS), internal standard, and serial dilution results, where applicable. A review of transcriptions from instrument data to sample summary sheets was performed. Calculation checks were performed on ten percent of the data set, where applicable. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

CompuChem received the samples on ice and in good condition, with custody seals intact. Applicable holding time and preservation criteria were met. The chain of custody was appropriately signed and dated by field and laboratory personnel.

Method 6020A (ICP-MS)

The original certificates of analysis were received on May 11, 2015. The certificates of analysis appeared complete in their presentation and the data were of acceptable quality. The data set demonstrated the laboratory's ability to achieve the reported permit quantitation limit (QL) or detection limit (DL).

QC documentation criteria were met. Applicable instrument tune, calibration and calibration verification requirements were met. Blank samples, interference check samples, pre-digestion MS/MSD, LCS, internal standard and serial dilution results were within control limits, except where noted below. Deviations from QA/QC control limits that were identified during the data review process are summarized below.

The QL standard concentration for antimony was 2 µg/l instead of 1 µg/l. The instrument data were evaluated and antimony was not detected in any sample at or above the detection limit (0.4 µg/l) or QL and no data qualification was required for antimony. The QL standard concentration was at or below the project QL for the other analytes.

Barium was diluted (1:2) in samples 16-3 and 16MW9. QLs and DLs were adjusted accordingly.

Beryllium recovered high in the MSD (127%) and detected results for beryllium were validated as estimated. Silver recovered low in the MS/MSD. Silver was not detected at or above the QL in any sample and silver results were validated and qualified as a "UJ" to note that the results were estimated. A post spike digestion was performed and silver recovered within the criteria.

Cobalt was detected above the QL in 16WC1A and 16MW9. A verification event to confirm or refute these detections was performed on May 26, 2015. For the verification event, cobalt (SDG: 1505062) was detected below the QL in 16WC1A and 16MW9. The verification results were reported as the final results.

Field duplicate/sample results exhibited acceptable precision, where applicable.

Target analytes detected at or above the permit detection limit or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table. The reported concentration for target analytes detected less than the QL should be considered estimated.

For this Appendix IX groundwater monitoring event, results for samples 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B, and 16WDUP were reported to at or above the permit detection

limit. Sample results unaffected by the data validation process, and not detected at or above the detection limit and/or QL, were validated and reported as "U." The reported concentration for target analytes detected less than the QL were validated and qualified "J" to note that the reported concentration should be considered estimated.

Sample results for 16-2, 16-3, 16-5, 16WC2B, and 16SPRING were reported at or above the permit required QL. Sample results unaffected by the data validation process, and not detected at or above the permit QL, were validated and reported as "U." No results were rejected based on the data validation criteria.

Method 7470A (CVAA)

The original certificates of analysis were received on May 11, 2015. The certificates of analysis appeared complete in its presentation and the final data were of acceptable quality. The certificate of analysis demonstrated the ability of the laboratory to achieve the reported permit required QL or DL for mercury.

QC documentation criteria were met. Instrument calibration and calibration verification criteria were met. QL standards, blank samples, MS/MSD, and LCS were analyzed as required and applicable criteria were met unless noted below. No deviations from QA/QC control limits were identified during the data review process.

Field duplicate/sample results exhibited acceptable precision, where applicable.

Target analytes detected at or above the permit detection limit or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table.

For samples 16-2, 16-3, 16-5, 16WC2B and 16SPRING, results were reported at or above the permit required QL. For this Appendix IX groundwater monitoring event, results for samples 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B were reported to at or above the permit detection limit. Sample results unaffected by the data validation process, and not detected at or above the detection limit and/or QL, were validated and reported as "U." No results were rejected based on the data validation criteria.

INORGANIC DATA EVALUATION FOR ICP/MS SW-846 METHOD 6020A

CompuChem, a Division of Liberty Analytical, Cary, NC; SDGs: 1504090, 1504091, 1505062
Preparation Method: 3005A
"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. DOCUMENTION COMPLETENESS CRITERIA:

Data Quality Objective: Representativeness

- ☑ Chain of custody – Custody transfers must be signed and dated
- ☑ Chain of custody properly and completely filled out including sampler signatures, date and time of sampling, sample ID, analysis requested

B. DETECTION LIMIT AND QUANTITATION LIMIT CRITERIA:

Data Quality Objective: Analytical Sensitivity

- ☑ Specific detection limit reported
- ☑ Specific quantitation limit reported
- ☑ Standard analyzed at the QL (LLQC), digested, 70-130% recovery, analyzed after MDL determination and as needed
- ☑ Method detection limit (MDL) less than QL
- ☑ Performance evaluation sample analyzed within 12 months

C. INITIAL DEMONSTRATION OF CAPABILITY (IDOC) CRITERIA:

Data Quality Objective: Laboratory Method Sensitivity

- ☑ Analyst IDOC for J. Feldhaus submitted previously

D. SAMPLE AND STANDARD PREPARATION CRITERIA:

Data Quality Objective: Accuracy and Representativeness

- ☑ Digestion prior to analysis
- ☑ Digestion method: 3005A
- ☑ Samples and standards matrix matched

E. TECHNICAL HOLDING TIME / PRESERVATION REQUIREMENTS:

Data Quality Objective: Representativeness

- ☑ 6 month holding time, pH<2 with Nitric Acid (HNO_3)

F. INSTRUMENT TUNE CRITERIA:

Data Quality Objective: Verify Operating Conditions

- ☑ Prior to calibration
- ☑ Relative Standard Deviation (RSD) </=5%
- ☑ Resolution < 0.9 amu full width at 10% peak height (or lower)
- ☑ Mass calibration </=0.1 amu difference from true value

G. INITIAL CALIBRATION CRITERIA:

Data Quality Objective: Laboratory Accuracy

- ☑ 1 calibration blank and 3 standards,
- ☑ Linear curve fit with correlation coefficient $r \geq 0.998$
- ☑ Daily calibration following tuning and prior to sample analysis

H. INITIAL CALIBRATION VERIFICATION (ICV) CRITERIA:

Data Quality Objective: Laboratory Accuracy

- ☑ Daily following initial calibration, independent/second source used for ICV

- ☑ ICV concentration near mid-point of calibration curve, 90-110% recovery
- ☑ Low level ICV (LLICV) – prior to analysis, at QL concentration, 70-130% recovery

I. INITIAL CALIBRATION BLANK CRITERIA:

Data Quality Objective: Laboratory Analytical Sensitivity/Instrument Drift/Contamination Evaluation

- ☑ Daily following ICV
- ☑ Interference free

J. CONTINUING CALIBRATION VERIFICATION (CCV) CRITERIA:

Data Quality Objective: Laboratory Analytical Accuracy

- ☑ CCV, prior to analysis, after every 10 samples, at end of analysis
- ☑ CCV recovery within 90-110%, mid-point of curve concentration
- ☑ Low level CCV (LLCCV), concentration at QL, prior to analysis, end of analysis, after every 10 samples, if necessary (70-130% R)

K. CONTINUING CALIBRATION BLANK CRITERIA:

Data Quality Objective: Laboratory Analytical Sensitivity/Instrument Drift/Contamination Evaluation

- ☑ Immediately after the CCV, 10 sample frequency
- ☑ Interference free

L. BLANK CRITERIA:

Data Quality Objective: Sensitivity/Instrument Drift/Contamination Evaluation

- N/A Trip Blank (check only if analyzed)
- ☑ Method/Other Lab Blanks (check only if analyzed), one per digestion batch
- ☑ Interference free

M. INTERFERENCE CHECK SAMPLE (ICS) CRITERIA:

Data Quality Objective: Analytical Accuracy/Verification of Isobaric Interference Corrections

- ☑ At beginning of analytical run
- ☑ Recovery: 80-120% (ICSAB)

N. MATRIX SPIKE DUPLICATE (MSD) CRITERIA:

Data Quality Objective: Method Precision in Sample Matrix

- ☑ All analytes, one MSD or sample duplicate per batch of 20 samples
- ☑ Spiked prior to sample preparation
- ☑ RPD $\leq$ 20 between MS and MSD results or sample and duplicate results
- ☑ MSD analyte recovery 75-125%

O. MATRIX SPIKE (MS) CRITERIA:

Data Quality Objective: Method Accuracy in Sample Matrix

- ☑ All analytes, one MS per digestion batch of 20 samples
- ☑ Spiked prior to sample preparation
- ☑ Recovery: 75-125%
- ☑ Post digestion spike if MS/MSD recoveries fail
- ☑ Recovery of post digestion spike analytes within 80-120%

P. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

Data Quality Objective: Laboratory Method Accuracy, Laboratory Performance

- ☑ LCS for all target analytes, one LCS per 20 sample batch
- ☑ LCS concentration at approximately mid-point of analytical curve
- ☑ Recovery within 80-120% for all analytes

Q. INTERNAL STANDARDS (IS) CRITERIA:

Data Quality Objective: Analytical Accuracy in Sample Matrix

- ☑ IS added to each sample and QC sample
- ☑ % Relative intensity (RI) within 70-125%

R. SERIAL DILUTION (DILUTION TEST) TEST CRITERIA:

Data Quality Objective: Accuracy in Sample Matrix

- ☑ <10% Difference (applicable when sample concentration >10X QL)

S. SAMPLE QUANTITATION AND GENERAL REPORTING CRITERIA:

Data Quality Objective: n/a

- ☑ Sample results reported within instrument linear dynamic range
- ☑ Sample results reported to the detection limit (compliance wells)
- ☑ Sample results reported to the quantitation limit (plume wells)

Draper Aden Associates conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, III and subsequent updates) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010). Validation of this data set is limited to review of items detailed in this data review report.

INORGANIC DATA EVALUATION FOR MERCURY BY COLD VAPOR AA SW-846 METHOD 7470A

CompuChem, a Division of Liberty Analytical, Cary, NC; SDGs: 1504090, 1504091
"☑" denotes items were reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA:
- ☑ Specific detection limits/quantitation limit (QLs) for target analyte
- ☑ Standard analyzed at the QL (70-130% Recovery)
- ☑ Passed single blind performance evaluation study within 12 months
- ☑ IDOC for analyst N. Bolton submitted previously

B. METHOD INFORMATION DOCUMENTATION:
- ☑ Mercury analyzed by requested method

C. TECHNICAL HOLDING TIME / PRESERVATION REQUIREMENTS:
- ☑ 28 day holding time
- ☑ Adjust pH <2 w/ HNO_3

D. INSTRUMENT CALIBRATION CRITERIA:
- ☑ 1 calibration blank and at least 3 standards, correlation coefficient >0.995
- ☑ Instrument calibrated for every analytical sequence for every method

E. INITIAL / CONTINUING CALIBRATION VERIFICATION CRITERIA:
- ☑ 10 sample frequency for CCV
- ☑ Recovery within 80-120%

F. BLANK SAMPLE CRITERIA:
- N/A Trip Blank (check only if analyzed)
- N/A Equipment Blank (check only if analyzed)
- ☑ Method/other laboratory blanks (check only if analyzed)
- ☑ Interference free

G. MATRIX SPIKE DUPLICATE (MSD) SAMPLE CRITERIA:
- ☑ One MSD or sample duplicate per batch of 20 samples
- ☑ RPD ≤20 between MS and MSD or sample and duplicate results
- ☑ Recovery 75-125% for MSD

H. MATRIX SPIKE (MS) SAMPLE CRITERIA:
- ☑ Recovery within 75-125% range
- ☑ One MS per batch of 20 samples
- ☑ MS added prior to digestion

I. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:
- ☑ LCS for mercury
- ☑ Recovery within 80-120%
- ☑ Independent source for LCS

J. SAMPLE RESULTS CRITERIA:

- ☑ Results reported within instrument calibration range
- ☑ Results reported to laboratory detection limit (compliance wells)
- ☑ Results reported to laboratory quantitation limit (plume wells)

Draper Aden Associates conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, III and subsequent updates) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010). Validation of this data set is limited to review of items detailed in this data review report.

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Engineering ♦ Surveying ♦ Environmental Services

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Date:

SW-846 METHOD 8260C VOLATILE ORGANICS DATA REVIEW SUMMARY

Draper Aden Associates performed a comprehensive manual review of the analytical results for the April 21-22, 2015 monitoring event at Hazardous Waste Management Unit 16 (HWMU 16) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected groundwater samples from monitoring wells 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B, 16-2, 16-3, 16-5, 16WC2B, and 16Spring. Groundwater sample 16WDUP was submitted to the laboratory as a blind field duplicate for 16WC1A.

Samples 16C1, 16MW8, 16MW9, 16WC1A, and 16WC1B (compliance monitoring wells) were analyzed for 66 volatile organic target analytes and samples 16-2, 16-3, 16-5, 16WC2B, and 16Spring (plume wells) were analyzed for 19 volatile organic target analytes per USEPA SW-846 Method 8260C. The following information and attached table summarize the Method 8260C data validation results.

Draper Aden Associates sent samples to Eurofins Lancaster Laboratories Environmental (ELLE), of Lancaster, Pennsylvania. ELLE performed the SW-846 Method 8260C volatile analysis. ELLE is a VELAP accredited laboratory for the analytes, method and matrix as reported on the certificate of analysis. Hexachloroethane was also analyzed by SW-846 Method 8270D (semivolatile analysis) and reported by an alternate laboratory. ELLE submitted results to Draper Aden Associates in a final certificate of analysis, which included sample analytical results as well as relevant documentation to validate and verify the results (SDG: RAE37).

The evaluation of ELLE's compliance with Method 8260C and validation of the results were based on a review of the following items: QC deliverables package, QC history documentation, technical holding times and preservation requirements, instrument performance (tune) check, instrument calibration and calibration verification data, blank samples analyses, surrogate spike recoveries, matrix spike and matrix spike duplicate (MS/MSD) analyses, laboratory control sample (LCS) data, internal standards requirements, and/or target analyte identification and quantitation. A review of transcriptions from instrument data to sample summary sheets was performed. Calculation verifications were performed on ten percent of the data set, where applicable. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

ELLE received the samples on ice and in good condition, with custody seals intact. The chain of custody (COC) was appropriately signed and dated by field and laboratory personnel. Technical holding time and preservation criteria were met, except where noted below.

The original certificate of analysis was received on May 14, 2015. The certificate of analysis appeared complete in its presentation and the data were of acceptable quality. The certificates of analysis demonstrated the ability of the laboratory to achieve the quantitation limit (QL) and method detection limit/detection (MDL/DL) for each target analyte, unless noted below.

QC deliverables package requirements were met. QC history documentation and instrument performance check criteria were met. Tuning, initial calibration, calibration verification, blanks, surrogates, MS/MSD, LCS and internal standards criteria were met, except where noted below. Sample results were verified and no transcription errors were observed.

Acrolein was analyzed using a sample aliquot adjusted to pH <2 SU. Acrolein was not reported as detected in any sample and sample results for this target analyte were validated and qualified as estimated ("UJ"). Acrolein is not a target analyte for the plume well samples.

Trans 1,4-dichloro-2-butene did not meet the initial calibration verification (ICV) standard percent difference/drift requirement (±30%). The sample results for this analyte were validated and qualified "UJ" due to the observed QC deficiency. The remaining ICV standard criteria were met.

Acrolein and 2-hexanone did not meet the continuing calibration verification (CV) standard percent difference/drift requirement (±20%). The sample results for these analytes were validated and qualified "UJ" due to the observed QC deficiency. The remaining CV standard criteria were met.

Diethyl ether recovered low in the MS (69%R). Diethyl ether sample results were validated and qualified as estimated "J" or "UJ" due to the observed QC deficiency. The remaining MS/MSD criteria were met.

Laboratory analysis was performed using a 25 ml purge volume for all analytes except 2-propanol. 2-Propanol analysis was performed using a 5 ml purge volume.

Field duplicate/sample results for 16WC1A exhibited acceptable precision, where applicable. A trip blank was submitted and analyzed for each day of sampling.

For sample 16C1 and 16MW9, the initial results for diethyl ether exceeded the instrument calibration range. These samples were reanalyzed in dilution and diethyl ether results from the dilution analysis were reported for these samples.

For compliance well samples 16C1, 16MW8, 16MW9, 16WC1A, 16WDUP, and 16WC1B, results were reported to at or above the permit detection limit for this Appendix IX monitoring event. Where permit MDLs were lower than the laboratory's current MDL study, results were reported to the laboratory MDL. For the remaining samples (plume wells), target analytes were reported to at or above the permit QL.

Target analytes detected at or above the detection limit or QL and/or analytical data that required a data validation qualifier due to quality control deviations noted above are summarized on the attached table. The reported concentration for target analytes detected less than the QL should be considered estimated.

Results for samples unaffected by the data validation process, and not detected at or above the detection limit and/or QL, were validated and reported as "U." No results were rejected based on the data validation criteria.

SW-846 METHOD 8260C (GC/MS) VOLATILE ORGANICS DATA VALIDATION

Comments: *Volatile organic analysis uses a purge and trap system to remove volatile organic target analytes from a 5 or 25 ml water sample (SW-846 5030C). Target analytes are separated and quantified using a capillary column gas chromatograph (GC)/mass spectrometer (MS).*

A. QC DELIVERABLES PACKAGE:

1.	Was the case narrative present/signed by a lab representative?	☑ YES ☐ NO
2.	Was the Chain of Custody present/signed by a lab representative?	☑ YES ☐ NO
3.	Were the sample results included for the sample locations?	☑ YES ☐ NO
4.	Did the results correspond to the project specific analyte list?	☑ YES ☐ NO
5.	Were the analyte LOQs reported on sample summary sheets in agreement with the MDL study?	See comment
6.	Were sample locations, analytes and QLs in agreement with the electronic deliverable (EDD)?	☑ YES ☐ NO

Comments: QC deliverables package requirements were met. The Appendix IX monitoring target analyte list was modified per the 2014 permit modification.

B. QC HISTORY DOCUMENTATION CRITERIA:

1.	Was an instrument specific MDL study provided which included DL and QL values for the target analytes?	☑ YES ☐ NO
2.	Was the instrument calibration range provided?	☑ YES ☐ NO
3.	Were the instrument specific check sample data provided for the target analytes?	☑ YES ☐ NO

Comments: Except as noted above, QC history documentation was provided and met criteria. The laboratory analyzed a MDL check sample at 1 µg/l (5 ml purge) and at 0.1 µg/l (25 ml purge) for most target analytes.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1.	Was the 14-day sample collection to analysis holding time met?	☑ YES ☐ NO
2.	Were the samples received at ≤6°C, zero headspace?	☑ YES ☐ NO
3.	Were the sample pHs adjusted to < 2 with HCl?	☑ YES ☐ NO
4.	Were the sample pHs adjusted to 4-5 with HCl? (Acrolein only)	☐ YES ☑ NO
5.	Were samples analyzed unpreserved (2-chloroethyl vinyl only)	☑ NA ☐ YES ☐ NO

Comments: Technical holding time and sample preservation criteria were met except where discussed in the data review summary above.

D. GC/MS INSTRUMENT PERFORMANCE (TUNING) CHECK CRITERIA:

1.	Was analysis of the instrument performance check solution performed at the beginning of each 12-hour period during which standards or samples were analyzed?	☑ YES ☐ NO
2.	Was there documentation of the injection of 5-50 ng bromofluorobenzene (BFB)?	☑ YES ☐ NO
3.	Were ion abundance criteria met?	☑ YES ☐ NO
4.	Were calibration, blank, and sample analyses performed within 12 hours of tuning?	☑ YES ☐ NO

Comments: Instrument performance check criteria were met.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1.	Was the internal standard (IS) which was selected for target analyte RF calculation the IS which had the closest retention time?	☑ YES ☐ NO
2.	Were the target analytes included in the ICAL?	☑ YES ☐ NO
3.	Were any calibration levels removed from the curve that would negatively influence the data integrity?	☐ YES ☑ NO
4.	Did the ICALs consist of a minimum of 5 calibration levels?	☑ YES ☐ NO
5.	Was the lowest concentration calibration standard at or below the associated MCL?	☑ YES ☐ NO
6.	Was the calibration curve developed using the same purge volume used for sample analysis?	☑ YES ☐ NO
7	Were 8260C minimum Relative Response Factor (RRF) criteria met? *Refer to Table 4- SW-846 Method 8260C (Rev3 2/06) for specific analyte RRFs*	☑ YES ☐ NO
8.	Was each target analyte %RSD ≤ 20%?	☑ YES ☐ NO
9.	Was the correlation coefficient >0.99 for target analytes with ≥20 % RSD? *(System recalibrated if >10% analytes fail above condition)*	☑ NA ☐ YES ☐ NO
10.	Was an initial calibration verification (ICV) standard analyzed immediately following the ICAL?	☑ YES ☐ NO
11.	Was the recovery within 70-130%?	See comment
12.	Was the ICV standard prepared from a different source from the ICAL ?	☑ YES ☐ NO

Method Validation Performance Criteria:

1.	Did target analytes and surrogates that have RSDs > 20% have ≥0.99 correlation coefficient or coefficient of determination?	☑ NA ☐ YES ☐ NO
2.	For linear regression curves, was the recalculated concentration of the low calibration point within ±30%?	☑ NA ☐ YES ☐ NO
3.	For quadratic curves, was a minimum six standards used?	☑ NA ☐ YES ☐ NO

Comments: Initial calibration criteria were met except where discussed in the data review summary above.

F. CALIBRATION VERIFICATION CRITERIA:

SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or analyzed independently during another 12-hour analysis period. ☑ YES ☐ NO
2. Were 8260C minimum Relative Response Factor (RRF) criteria met?
   Refer to Table 4- SW-846 Method 8260C (Rev3 2/06) for specific analyte RRFs ☑ YES ☐ NO
3. Did the target analytes and system monitoring analytes (surrogates) have the % D within ± 20%? See comment
   If "NO", list analytes that exceed these criteria:

Draper Aden Associates Contractual Requirements:

1. Did the target analytes and system monitoring analytes (surrogates) have % Ds within ± 20%? See comment

Comments: The CV standard criteria were met except as noted above.

G. BLANK CRITERIA:

1. Was a method blank analyzed after the calibration standards, prior to sample analysis, and once for every 12-hour period beginning with the injection of BFB? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☑ YES ☐ NO
3. Were the trip blanks and method blanks interference free? See comment
4. Was the level of blank contamination less than 5% of the regulatory limit associated with an analyte or less than 5% of the sample result for the same analyte, whichever is greater? ☑ NA ☐ YES ☐ NO
5. List target analytes detected in the blanks: *None*
6. Did any result exceed the calibration range? ☑ YES ☐ NO
7. Were one or more blanks analyzed following the high concentration sample to prevent cross contamination? ☐ YES ☑ NO

Comments: Blank criteria were met or no data qualification was needed.

H. SURROGATE CRITERIA:

SW-846 Criteria:

1. Were the following surrogates used? ☑ YES ☐ NO
   - dibromofluoromethane (80-120%)
   - 4-bromofluorobenzene (80-120%)
   - toluene-d8 (80-120%)
   - 1,2-dichloroethane-d4 (80-120%)
2. Were recoveries within specified ranges? ☑ YES ☐ NO
   If "NO", corrective action is required. Flagging of the data as estimated is not acceptable until corrective action has been attempted

3. Were samples with surrogates outside the QC window reanalyzed as required? ☑ NA ☐ YES ☐ NO

Comments: Surrogate criteria were met.

I. MATRIX SPIKE, MATRIX SPIKE DUPLICATE (MS/MSD) CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Analyte	*% R Water*	*% RPD Water*
1,1-dichloroethene	61-145	14
trichloroethene	71-120	14
benzene	76-127	11
toluene	76-125	13
chlorobenzene	75-130	13

1. Was a matrix spike and matrix spike duplicate (MS/MSD) analyzed per sample batch or every 20 samples, whichever may occur first? ☑ YES ☐ NO
2. Did the MS/MSD spike contain additional target analytes? ☑ YES ☐ NO
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. MS/MSD acceptance range: 75-125%; 70-130% for poor purge analytes; RPD ≤20 if not otherwise specified.
5. Were any analytes qualified as estimated due to MS/MSD criteria? ☑ YES ☐ NO
   - If yes, and the LCS for the analyte(s) recovered within control limits, matrix interference is suspected.

Comments: MS/MSD criteria were met except as discussed in review summary above.

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample batch analysis? ☑ YES ☐ NO
2. Did the LCS contain the required target analytes? (No TICs) ☑ YES ☐ NO
3. List the LCS acceptance criteria: 80-120%; 70-130% for poor purge analytes
4. Were any analytes qualified as estimated? ☐ YES ☑ NO

Comments: LCS criteria were met.

K. INTERNAL STANDARDS (IS) CRITERIA:

1. Were the following internal standards (IS) used? ☑ YES ☐ NO
   t-butyl alcohol-d10, fluorobenzene, chlorobenzene-d_5, 1,4-dichlorobenzene-d_4
2. Were IS areas within - 50% to + 100% of the last CV? ☑ YES ☐ NO
3. Were IS RTs within ± 30 seconds of the last CV? ☑ YES ☐ NO
4. Were samples failing Items 2 and/or 3 above reanalyzed as required by the method? ☑ NA ☐ YES ☐ NO

Comments: Internal standards criteria were met.

L. TARGET ANALYTE IDENTIFICATION:

1. Were the RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT? ☑ YES ☐ NO
2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met:
   * Did characteristic ions maximize in the same scan or within one scan of each other? ☑ YES ☐ NO
   * Were characteristic ions present in the standard spectra and sample spectra for analytes detected above the QL? ☑ YES ☐ NO
   * Were the relative intensities of the ions between the standard and sample spectra within ± 30%? ☑ YES ☐ NO
3. Were the reported analytes confirmed? ☑ YES ☐ NO

Comments: See attached table for detected analytes. Identification criteria were met.

M. TARGET ANALYTE QUANTITATION:

* If the %RSD of an analyte was 20% or less, then the average relative response factor should have been used for quantitation.
* If the %RSD of an analyte was greater than 20%, then the quantitation should have been based on a calibration curve using the first or higher order regression fit of the five calibration points. (6 calibration points for 2nd order).

1. List the detected analytes whose %RSD was > 20%:
   - Was quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
2. Did the initial analysis of any sample have a concentration of an analyte which exceeded the initial calibration range? ☑ YES ☐ NO
   If so, was the sample reanalyzed at a higher dilution? ☑ YES ☐ NO
3. Were the analyte concentrations that were recorded on the raw sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO
4. Were field sample duplicate RPDs <20 where applicable? ☑ YES ☐ NO

Comments: Target analyte quantitation criteria were met, where applicable.

N. CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

The IDOC for analysts L. Pape, K. Legerlotz, A. Sneeringer, and Sara Johnson have been previously submitted by the laboratory. No other corrective action was taken.

REFERENCES:

Draper Aden Associates conducted data validation of the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data validation was conducted in general accordance with SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates) and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 and USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008, where applicable). Validation of this data set is limited to the items detailed in this report.

LIMITATIONS:

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

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SW-846 METHOD 8270D SEMIVOLATILE DATA REVIEW SUMMARY

Draper Aden Associates performed a comprehensive manual review of the analytical results for the April 21-22, 2015 groundwater monitoring event at Hazardous Waste Management Unit 16 (HWMU 16) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected groundwater samples from monitoring wells 16C1, 16MW8, 16MW9, 16WC1A, 16WC1B, 16-2, 16-3, 16-5, 16WC2B, and 16Spring. Groundwater sample 16WDUP was submitted to the laboratory as a blind sample duplicate for 16WC1A.

Samples 16C1, 16MW8, 16MW9, 16WC1A, and 16WC1B (compliance monitoring wells) were analyzed for 114 semivolatile target analytes. Samples 16-2, 16-3, 16-5, 16WC2B, and 16Spring (plume wells) were analyzed for three semivolatile target analytes per USEPA SW-846 Method 8270D. The following information and attached table summarize the Method 8270D data validation results. Validation of other required methods are presented on separate reports.

Draper Aden Associates sent samples to CompuChem (CompuChem), a Division of Liberty Analytical, of Cary, North Carolina, for the GC/MS semivolatile analysis. CompuChem is a VELAP accredited laboratory for the analytes, method and matrix as reported on the certificates of analysis. CompuChem submitted results to Draper Aden Associates in a final certificate of analysis that included sample analytical results as well as relevant QA/QC and method performance criteria documentation to verify and validate the results (SDGs: 1504090/1504091).

The evaluation of CompuChem's compliance with Method 8270D and validation of the results was based on a review of the following items: QC deliverables package, QC history documentation, case narrative, technical holding time and preservation requirements, instrument performance (tune) check, instrument calibrations, blank analysis, surrogate spike recoveries, matrix spike and matrix spike duplicate (MS/MSD) analyses, laboratory control sample (LCS) data, and internal standard requirements. A review of the transcriptions from instrument data to sample summary sheets was performed. Calculation verifications were performed on ten percent of the data set, where applicable. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

CompuChem received the samples on ice and in good condition, with custody seals intact. The chain of custody was appropriately signed and dated by field and laboratory personnel. Technical holding time and sample preservation were met.

The original certificates of analyses were received on May 11, 2015. The certificate of analysis appeared complete and the data were of acceptable quality, except where noted below. The data set demonstrated the laboratory's ability to achieve the reported permit required quantitation limit (QL) or detection limit (DL), unless noted below.

QC history documentation, instrument performance check (tuning) criteria, calibration, blank, surrogate, MS/MSD, LCS and internal standard requirements were met, except where noted below. Sample results were reviewed for transcription errors from the instrument data to the

laboratory report and no errors were noted. Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

3,3'-Dimethylbenzidine exceeded the initial calibration verification standard percent difference/drift requirement (±30%). This analyte was not detected at or above the detection limit or permit QL in any sample and results for this analyte were validated and qualified "UJ" due to the observed QC deficiency. The remaining ICV standard criteria were met.

1,4-Naphthoquinone, 1-naphthylamine, 4-nitroaniline (a.k.a., p-nitroanaline), and a,a-dimethylphenethylamine recovered low in the MS and/or MSD. 3,3'-Dimethylbenzidine did not recover in the MS/MSD; a,a-dimethylphenethylamine did not recover in the MSD. These analytes were not detected at or above the detection limit or permit QL in any sample. Results for these analytes were validated and qualified "UJ" due to the observed QC deficiency. The remaining MS/MSD criteria were met or no data qualifications were needed. Field duplicate/sample results exhibited acceptable precision, where applicable.

1,4-Naphthoquinone and 1,4-benzenediamine (p-phenylenediamine) recovered low in the LCS and/or LCSD. These analytes were not detected at or above the detection limit or permit QL in any sample. Results for these analytes were validated and qualified "UJ" due to the observed QC deficiency. The remaining LCS criteria were met or no data qualifications were needed.

For this Appendix IX monitoring event, results for compliance wells (16C1, 16MW8, 16MW9, 16WC1A and 16WC1B) were reported to at or above the detection limit. The detection limit was based on the current laboratory MDL study. For plume wells (16-2, 16-3, 16-5, 16WC2B, and 16Spring), results were reported to at or above the permit required QL. The sample results unaffected by the data validation process, and not detected at or above the detection limit and/or QL, were validated and reported as "U." No results were rejected based on the data validation criteria.

SW-846 METHOD 8270D (GC/MS) SEMIVOLATILE ORGANIC DATA VALIDATION

Comments: *Semivolatile (a.k.a, base/neutral and acid extractables) analysis involves sample preparation using SW-846 Method 3510C. The semivolatile extracts are concentrated through evaporation. Target analytes are separated and quantified using a capillary column gas chromatograph (GC)/mass spectrometer (MS).*

A. QC DELIVERABLES PACKAGE:

1. Was the case narrative present/signed by a lab representative? ☑ YES ☐ NO
2. Was the Chain of Custody present/signed by a lab representative? ☑ YES ☐ NO
3. Were the sample results included for the sample locations? ☑ YES ☐ NO
4. Did the data correspond to the project specific analyte list? ☑ YES ☐ NO
5. Were target analyte QLs reported on sample summary sheets in agreement with the instrument specific MDL study? ☑ YES ☐ NO

Comments: QC deliverables package criteria were met.

B. QC HISTORY DOCUMENTATION CRITERIA:

1. Were instrument specific detection limits provided for the analytes? ☑ YES ☐ NO
2. Were the instrument specific QLs for target analytes provided? ☑ YES ☐ NO
3. Was calibration range specified for the target analytes? ☑ YES ☐ NO

Comments: QC history documentation criteria were met.

C. TECHNICAL HOLDING TIME AND PRESERVATION CRITERIA:

1. Was the 7-day sample collection to extraction holding time met? ☑ YES ☐ NO
2. Was the 40-day extraction to analysis holding time met? ☑ YES ☐ NO
3. Were the samples received at $\leq 6^{o}C$? ☑ YES ☐ NO

Comments: The sample collection to extraction/analysis holding times and preservation criteria were met.

D. GC/MS INSTRUMENT PERFORMANCE CHECK CRITERIA:
(Tuning, Injection Port and Column Performance)

1. Was analysis of the instrument performance check solution performed at the beginning of each 12-hour period of standard and/or sample analysis? ☑ YES ☐ NO
2. Was there documentation of the injection of 50 ng of DFTPP? ☑ YES ☐ NO
3. Were ion abundance criteria met? ☑ YES ☐ NO
4. Was the injection port inertness verified by analysis of 4,4'-DDT? ☑ YES ☐ NO
5. Was the degradation of DDT to DDE and DDD <20%? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was the injection port inertness check acceptable? ☑ YES ☐ NO

6. Was column performance checked through the analysis of peak tailing (<2 tailing factor) of pentachlorophenol and benzidine? ☑ YES ☐ NO
   - If no, does associated data require qualification? ☑ NA ☐ YES ☐ NO
   - Was column performance check acceptable? ☐ NA ☑ YES ☐ NO

Comments: Instrument performance check criteria were met. Laboratory tune criteria windows are within those specified by 8270D.

E. INITIAL GC/MS CALIBRATION CRITERIA:

SW-846 Criteria:

1. Were the initial calibrations (ICAL) and any directly associated blanks and samples analyzed within 12-hours of the associated instrument performance (tune) check? ☑ YES ☐ NO
2. Were quantitation ions, used and listed on data, randomly checked against primary quantitation ions as required by Method 8270D and the RFP? ☑ YES ☐ NO
3. Were target analytes included in the ICAL? ☑ YES ☐ NO
4. Did the ICAL consist of a minimum of 5 calibration levels? ☑ YES ☐ NO
5. Was the lowest concentration calibration standard at or below the associated MCL, regulatory compliance, or action limit? ☑ YES ☐ NO
6. Were calibration standards dropped to meet calibration criteria? ☐ YES ☑ NO
7. Were 8270D minimum RRF criteria met?
   Relative Response Factor-range (RRF 0.010-0.900) ☑ YES ☐ NO
   **Refer to Table 4 of SW-846 Method 8270D (Rev4 2/07) for specific analyte RRFs*
8. Was each target analyte %RSD ≤ 20%? ☐ YES ☑ NO
9. Was the correlation coefficient or coefficient of determination >0.99 for target analytes with > 20% RSD? ☑ YES ☐ NO
   **System recalibrated if >10% analytes fail above condition*
10. Was an initial calibration verification (ICV) standard analyzed immediately following the ICAL? ☑ YES ☐ NO
11. Was the recovery within 70-130%? ☐ YES ☑ NO
12. Was the ICV standard prepared from a different source from the ICAL ? ☑ YES ☐ NO

Method Validation Performance Criteria:

1. Did target analytes and surrogates that have RSDs > 20% have ≥0.99 correlation coefficient or coefficient of determination? ☑ YES ☐ NO
2. For linear regression curves, was the recalculated concentration of the low calibration point within ±30%? ☑ YES ☐ NO
3. For quadratic curves, was a minimum six standards used? ☑ YES ☐ NO

Comments: Initial calibration criteria were met except as noted in the summary above.

F. CALIBRATION VERIFICATION CRITERIA:

SW-846 Criteria:

1. Was a calibration verification analyzed at the beginning of each 12-hour period following the analysis of the instrument

performance check and prior to analysis of the method blank and samples? The calibration verification may be part of the ICAL or analyzed independently during another 12-hour analysis period. ☑ YES ☐ NO

2. Were 8260C minimum Relative Response Factor (RRF) criteria met?
Refer to Table 4- SW-846 Method 8260C (Rev3 2/06) for specific analyte RRFs ☑ YES ☐ NO
3. Did the target analytes and system monitoring analytes (surrogates) have the % D within ± 20%? ☑ YES ☐ NO
If "NO", list analytes that exceed these criteria:

Draper Aden Associates Contractual Requirements:

1. Did the target analytes and system monitoring analytes (surrogates) have % Ds within ± 20%? ☑ YES ☐ NO

Comments: The CV standard criteria were met.

G. BLANK CRITERIA:

1. Was a method/extraction blank analyzed on each GC/MS system used for sample analysis? ☑ YES ☐ NO
2. Was a trip blank analyzed with this sample batch? ☑ NA ☐ YES ☐ NO
3. Were the blank samples interference free? ☑ YES ☐ NO
4. Was the level of blank contamination > 5% of the MCL? ☑ NA ☐ YES ☐ NO
5. List target analytes detected in the blanks: *none*

Comments: Blank criteria were met.

H. SURROGATE CRITERIA:

1. Were the following surrogates used? ☑ YES ☐ NO
   - phenol - d_6 (10%-94%)
   - 2-fluorophenol (21%-100%)
   - 2,4,6-tribromophenol (10%-123%)
   - nitrobenzene – d_5 (43%-108%)
   - 2-fluorobiphenyl (43%-116%)
   - p-terphenyl - d_{14} (33%-141%)
2. Were recoveries within the specified ranges? ☑ YES ☐ NO
3. Were any two base/neutral or acid surrogates out of specification or did any one base/neutral or acid extractable surrogate have a recovery of less than 10%? ☐ YES ☑ NO
If yes, was a re-extraction and reanalysis performed to confirm that the non-compliance was due to sample matrix effects rather than laboratory deficiencies? ☑ NA ☐ YES ☐ NO

Comments: The laboratory made one surrogate substitution (phenol-d5 for phenol-d6) as allowed by the method. Surrogate recovery criteria were met.

I. MATRIX SPIKE/ MATRIX SPIKE DUPLICATE (MS/MSD) CRITERIA:

(MS/MSD Requirements - CLP Guidelines)

Analyte	% R Water	% RPD Water
Phenol	12-110	42
2-Chlorophenol	27-123	40
N-Nitroso-di-n-propylamine	41-116	38
4-Chloro-3-methylphenol	23-97	42
Acenaphthene	46-118	31
4-Nitrophenol	10-80	50
2,4-Dinitrotoluene	24-96	38
Pyrene	26-127	31

1. Was a MS/MSD analyzed per sample batch or every 20 samples, whichever may occur first? ☑ YES ☐ NO
2. Did the MS/MSD spike contain additional target analytes? ☑ YES ☐ NO
3. Was the MS/MSD analyzed on the specific project matrix? ☑ YES ☐ NO
4. List MS/MSD target analytes not within laboratory recovery ranges: *See comment*
5. Was a LCS analyzed to address failed MS spike criteria? ☑ YES ☐ NO
6. Did the LCS for the failed MS analyte(s) fall within the recovery ranges and was the problem identified as matrix interference? *See comment*
7. Were analytes qualified as estimated due to MS/MSD criteria? ☑ YES ☐ NO
   - If yes, and the LCS for the analyte(s) recovered within control limits, matrix interference is suspected.

Comments: MS/MSD criteria were met except as noted in the review summary above.

J. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

1. Was a LCS included in the sample analysis? ☑ YES ☐ NO
2. Did the LCS contain the required target analytes? ☑ YES ☐ NO
3. List the LCS target analytes and laboratory recovery range. *See semivolatile certificate of analysis.*
4. Were any analytes qualified as estimated due to LCS criteria? ☑ YES ☐ NO

Comments: LCS criteria were met except as discussed in the review summary above.

K. INTERNAL STANDARDS CRITERIA:

1. Were the following internal standards (IS) used? ☑ YES ☐ NO
   - 1,4-Dichlorobenzene-d_4
   - Naphthalene-d_8
   - Acenapththene-d_{10}
   - Phenanthrene-d_{10}
   - Chrysene-d_{12}
   - Perylene-d_{12}
2. Were IS areas within ± 50% of last CV? ☑ YES ☐ NO
3. Were IS RTs within ± 30 seconds of last CV? ☑ YES ☐ NO

Comments: Internal standard criteria were met.

L. TARGET ANALYTE IDENTIFICATION:

1. Were the RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT? ☑ YES ☐ NO
2. Check the sample spectra against the laboratory standard spectra to see that the following criteria were met: ☑ YES ☐ NO
   * Did characteristic ions maximize in the same scan or within one scan of each other?
   * Were the characteristic ions present in the standard spectra present in the sample spectra for analytes detected above the QL?
   * Were the relative ion intensities between the standard and sample spectra within ± 30%?
3. Were the reported analytes confirmed? ☑ YES ☐ NO

Comments: Target analyte identification criteria were met. No target analytes were detected at or above the detection limit or permit QL (compliance samples) or the permit QL (plume samples) except for diethyl phthalate in 16MW9.

M. TARGET ANALYTE QUANTITATION:

* If the %RSD of an analyte was 20% or less, then the average relative response factor should have been used for quantitation.
* If the %RSD of an analyte was greater than 20%, then the quantitation should be based on a calibration curve using the first or higher order regression fit of the five calibration points (6 calibration points for 2nd order).

1. List the analytes detected above the QL whose %RSD was >20%: *None*
   a. Was quantitation based on a linear regression fit? ☑ NA ☐ YES ☐ NO
   b. Was the curve forced through the origin? ☑ NA ☐ YES ☐ NO
2. Did the initial analysis of any sample have a concentration of a target analyte that exceeded the initial calibration range? ☐ YES ☑ NO
   -If so, was the sample reanalyzed at a higher dilution? ☑ NA ☐ YES ☐ NO
3. Were the analyte concentrations that were recorded on the raw sample quantitation reports accurately transferred to the sample summary sheets? ☑ YES ☐ NO

Comments: Target analyte quantitation criteria were met.

N. CORRECTIVE ACTION TAKEN AND GENERAL COMMENTS:

Comments: Analyst IDOC for OWS was provided previously. No other corrective action was required. Library searches were not requested with this data set.

REFERENCES:

Draper Aden Associates conducted data validation of the above noted data set using summary tables and raw data provided by the analyzing laboratory. Data validation was conducted in general accordance with SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates) and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 and USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008, where applicable). Validation of this data set is limited to the items detailed in this report.

LIMITATIONS:

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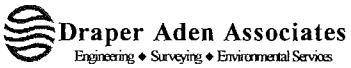

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SW-846 METHOD 9012B DATA REVIEW SUMMARY

Draper Aden Associates performed a comprehensive manual review of the analytical results for the April 21-22, 2015 monitoring event at Hazardous Waste Management Unit 16 (HWMU 16) located at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia. Draper Aden Associates collected the groundwater samples from monitoring wells 16C1, 16MW8, 16MW9, 16WC1A, and 16WC1B. Sample 16WDUP was submitted to the laboratory as a blind field sample duplicate for 16WC1A.

The samples were analyzed for cyanide by SW-846 Method 9012B. The following information and attached table summarize the data validation results. Validation of other required methods is presented on separate reports.

Draper Aden Associates sent samples to CompuChem (CompuChem), a Division of Liberty Analytical, of Cary, North Carolina. CompuChem performed the Method 9012B analysis. The laboratory submitted results to Draper Aden Associates in a final certificate of analysis, which included sample analytical results as well as relevant documentation to validate and verify the results. The laboratory is a VELAP accredited laboratory for the above analyte, method, and matrix reported.

The evaluation of CompuChem's compliance with the analytical methods and validation of results presented here are based upon a limited review of QA/QC information including holding times, preservation procedures and standards, blank samples analyses (method, calibration and other blanks), matrix spike/matrix spike duplicate (MS/MSD) or matrix spike/sample duplicate (MS/DUP), and laboratory control standard (LCS) results. A review of transcriptions from instrument data to sample summary sheets was performed. Calculation checks were performed on a minimum ten percent of the data set. The following information is intended to summarize data review results and any observed significant deviations from method and/or contractual requirements.

CompuChem received the samples in good condition with custody seals intact. Technical holding time and preservation criteria were met, unless noted below.

The original certificate of analysis was received on May 11, 2015. The certificate of analysis appeared complete in its presentation and the data were of acceptable quality. Documentation was provided to demonstrate the ability of the laboratory to achieve the reported project quantitation limit (QL) or detection limit (DL) for cyanide.

QC history documentation, holding time, sample preservation, instrument calibration and calibration verification criteria were met. Blank, MS/MSD, and LCS samples were analyzed as required and results were within control limits. The blanks were interference free, except where noted below.

Cyanide was detected in the laboratory preparation blank. However, cyanide was not detected in any sample at or above the QL or DL and no data qualification was required. The remaining blank criteria was met.

Field duplicate/sample results exhibited acceptable precision, where applicable.

For this Appendix IX monitoring event, cyanide results were reported to at or above the detection limit. Cyanide was not detected at or above the permit defined detection limit or QL in any sample and sample results for cyanide were validated and reported as "U." No results were rejected based on data validation criteria.

INORGANIC DATA EVALUATION FOR CYANIDE BY SW-846 METHOD 9012B

CompuChem, a Division of Liberty Analytical, Cary, NC; SDG: 1504090
Preparation Method: 9010C
"☑" denotes items reviewed. See Data Validation Summary for additional comments.

A. QC DOCUMENTATION CRITERIA:
- ☑ Specific detection limit for target analyte
- ☑ Specific QLs for target analyte
- ☑ Passed single blind performance evaluation study within 12 months
- ☑ IDOC for analyst N. Bolton submitted previously

B. METHOD INFORMATION DOCUMENTATION:
- ☑ Cyanide analyzed by requested method

C. TECHNICAL HOLDING TIME / PRESERVATION REQUIREMENTS:
- ☑ 14 day holding time
- ☑ Cool ≤6° C
- ☑ Adjust pH >12 w/ NaOH

D. INSTRUMENT CALIBRATION CRITERIA:
- ☑ 1 calibration blank and at least 3 standards; correlation coefficient ≥ 0.995

E. INITIAL / CONTINUING CALIBRATION VALIDATION CRITERIA:
- ☑ ICV, 10 sample frequency for CCV
- ☑ Distilled check standards (high/low) per batch of samples (90-110%)
- ☑ CCV Recovery within 85-115%

F. BLANK SAMPLE CRITERIA:
- ☑ Interference free
- ☑ ICB, then 10 sample frequency for CCB
- ☑ One preparation blank per sample batch

G. MATRIX SPIKE DUPLICATE (MSD) SAMPLE CRITERIA:
- ☑ One MSD or sample duplicate for every 20 samples
- ☑ RPD ≤20 between MS and MSD or sample and duplicate results
- ☑ Recovery 75-125% for MSD

H. MATRIX SPIKE (MS) SAMPLE CRITERIA:
- ☑ One MS sample for every 20 samples
- ☑ MS recovered within 75-125%
- ☑ Spike added prior to distillation

I. LABORATORY CONTROL SAMPLE (LCS) SAMPLE CRITERIA:

- ☑ One LCS sample for every 20 samples
- ☑ LCS recovered within 80-120%
- ☑ Spike added prior to distillation

J. SAMPLE RESULTS CRITERIA:

- ☑ Sample results reported within calibration range
- ☑ Sample results reported to the method detection limit

REFERENCES:

Draper Aden Associates conducted a limited data validation of the above noted data set using the data package provided by the analyzing laboratory. Data evaluation was conducted using SW-846 (Test Methods for Evaluating Solid Waste-Physical/Chemical Methods, USEPA, SW-846, 3rd Edition-Final Update I, II/IIA, III and subsequent updates) method requirements and CLP data validation guidelines (USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004 and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010). Validation of this data set is limited to review of items detailed in this data review report.

LIMITATIONS:

Draper Aden Associates prepared this document (which may include drawings, specifications, reports, studies and attachments) in accordance with the agreement between Draper Aden Associates and BAE Systems, Ordnance Systems, Inc.

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Conclusions presented are based upon a review of available information, the results of our field studies, and/or professional judgment. To the best of our knowledge, information provided by others is true and accurate, unless otherwise noted. Draper Aden Associates liability, hereunder, shall be limited to amounts due Draper Aden Associates for services actually rendered, or reimbursable expenses actually incurred. Any reuse or modification of any of the aforementioned documents (whether hard copies or electronic transmittals) prepared by Draper Aden Associates without written verification or adaptation by Draper Aden Associates will be at the sole risk of the individual or entity utilizing said documents and such use is without the authorization of Draper Aden Associates. Draper Aden Associates shall have no legal liability resulting from any and all claims, damages, losses, and expenses, including attorney's fees arising out of the unauthorized reuse or modification of these documents. Client shall indemnify Draper Aden Associates from any claims arising out of unauthorized use or modification of the documents whether hard copy or electronic.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

This Report has been prepared by:

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Date: 7/28/15

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Date: 7/28/15

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
DIVISION OF CONSOLIDATED LABORATORY SERVICES

Certifies that

VA Laboratory ID#: 460188
Compuchem, A Division of Liberty Analytical

501 Madison Avenue
Cary, NC 27513

Owner: JOSEPH WORTLEY
Responsible Official: WILLIAM WARING

Having met the requirements of 1 VAC 30-46
and the National Environmental Laboratory Accreditation Conference 2003 Standard
is hereby approved as an

Accredited Laboratory

As more fully described in the attached Scope of Accreditation

Effective Date: **September 15, 2014**
Expiration Date: **September 14, 2015**
Certificate # 6537

Denise M. Toney

Denise M. Toney, Ph.D., HCLD
DGS Deputy Director for Laboratories

Continued accreditation status depends on successful ongoing participation in the program.
Certificate to be conspicuously displayed at the laboratory.
Not valid unless accompanied by a valid Virginia Environmental Laboratory Accreditation Program (VELAP) Scope of Accreditation.
Customers are urged to verify the laboratory's current accreditation status.

Certificate Not Transferable

Surrender Upon Revocation

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 6537

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Cary, NC 27513

Virginia Laboratory ID: 460188
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Expiration Date: September 14, 2015

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	FL
EPA 1664 A	OIL AND GREASE (AS HEM)	FL
EPA 300.0 REV 2.1	CHLORIDE	FL
EPA 300.0 REV 2.1	NITRATE AS N	FL
EPA 300.0 REV 2.1	NITRITE AS N	FL
EPA 300.0 REV 2.1	SULFATE	FL
EPA 335.4 REV 1.0	CYANIDE	FL
EPA 351.2 REV 2	KJELDAHL NITROGEN - TOTAL	FL
EPA 353.2 (AS LACHAT 10-107-04-1-C)	NITRATE/NITRITE	FL
EPA 365.4	PHOSPHORUS, TOTAL	FL
EPA 6010 C	ALUMINUM	FL
EPA 6010 C	ARSENIC	FL
EPA 6010 C	BERYLLIUM	FL
EPA 6010 C	CADMIUM	FL
EPA 6010 C	CHROMIUM	FL
EPA 6010 C	COPPER	FL
EPA 6010 C	LEAD	FL
EPA 6010 C	MANGANESE	FL
EPA 6010 C	NICKEL	FL
EPA 6010 C	SELENIUM	FL
EPA 6010 C	SODIUM	FL
EPA 6010 C	TIN	FL
EPA 6010 C	VANADIUM	FL
EPA 6020 A	ANTIMONY	FL
EPA 6020 A	BARIUM	FL
EPA 6020 A	CADMIUM	FL
EPA 6020 A	COBALT	FL
EPA 6020 A	LEAD	FL
EPA 6020 A	NICKEL	FL
EPA 6020 A	SILVER	FL
EPA 6020 A	VANADIUM	FL
EPA 7470 A	MERCURY	FL
EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	FL
EPA 8081 B	4,4'-DDE	FL
EPA 130.1	TOTAL HARDNESS AS CACO3	FL
EPA 1664 A	TOTAL PETROLEUM HYDROCARBONS (TPH) (AS NONPOLAR MATERIAL, SGT-HEM)	FL
EPA 300.0 REV 2.1	FLUORIDE	FL
EPA 300.0 REV 2.1	NITRATE/NITRITE	FL
EPA 300.0 REV 2.1	ORTHOPHOSPHATE AS P	FL
EPA 310.2 (AS LACHAT 10-303-31-1-A)	ALKALINITY AS CACO3	FL
EPA 350.1 REV 2	AMMONIA AS N	FL
EPA 353.2 (AS LACHAT 10-107-04-1-C)	NITRATE AS N	FL
EPA 353.2 (AS LACHAT 10-107-04-1-C)	NITRITE AS N	FL
EPA 420.4 REV 1	TOTAL PHENOLICS	FL
EPA 6010 C	ANTIMONY	FL
EPA 6010 C	BARIUM	FL
EPA 6010 C	BORON	FL
EPA 6010 C	CALCIUM	FL
EPA 6010 C	COBALT	FL
EPA 6010 C	IRON	FL
EPA 6010 C	MAGNESIUM	FL
EPA 6010 C	MOLYBDENUM	FL
EPA 6010 C	POTASSIUM	FL
EPA 6010 C	SILVER	FL
EPA 6010 C	THALLIUM	FL
EPA 6010 C	TITANIUM	FL
EPA 6010 C	ZINC	FL
EPA 6020 A	ARSENIC	FL
EPA 6020 A	BERYLLIUM	FL
EPA 6020 A	CHROMIUM	FL
EPA 6020 A	COPPER	FL
EPA 6020 A	MANGANESE	FL
EPA 6020 A	SELENIUM	FL
EPA 6020 A	THALLIUM	FL
EPA 6020 A	ZINC	FL
EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	FL
EPA 8081 B	4,4'-DDD	FL
EPA 8081 B	4,4'-DDT	FL

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8081 B	ALDRIN	FL	EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	FL	EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	CHLORDANE (TECH.)	FL	EPA 8081 B	DELTA-BHC	FL
EPA 8081 B	DIELDRIN	FL	EPA 8081 B	ENDOSULFAN I	FL
EPA 8081 B	ENDOSULFAN II	FL	EPA 8081 B	ENDOSULFAN SULFATE	FL
EPA 8081 B	ENDRIN	FL	EPA 8081 B	ENDRIN ALDEHYDE	FL
EPA 8081 B	ENDRIN KETONE	FL	EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	FL	EPA 8081 B	HEPTACHLOR	FL
EPA 8081 B	HEPTACHLOR EPOXIDE	FL	EPA 8081 B	METHOXYCHLOR	FL
EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	FL	EPA 8082 A	AROCLOR-1016 (PCB-1016)	FL
EPA 8082 A	AROCLOR-1221 (PCB-1221)	FL	EPA 8082 A	AROCLOR-1232 (PCB-1232)	FL
EPA 8082 A	AROCLOR-1242 (PCB-1242)	FL	EPA 8082 A	AROCLOR-1248 (PCB-1248)	FL
EPA 8082 A	AROCLOR-1254 (PCB-1254)	FL	EPA 8082 A	AROCLOR-1260 (PCB-1260)	FL
EPA 8151 A	2,4,5-T	FL	EPA 8151 A	2,4-D	FL
EPA 8151 A	2,4-DB	FL	EPA 8151 A	4-NITROPHENOL	FL
EPA 8151 A	DALAPON	FL	EPA 8151 A	DICAMBA	FL
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	FL	EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	FL
EPA 8151 A	PENTACHLOROPHENOL	FL	EPA 8151 A	SILVEX (2,4,5-TP)	FL
EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	FL	EPA 8260 B	1,1,1-TRICHLOROETHANE	FL
EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	FL	EPA 8260 B	1,1,2-TRICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHANE	FL	EPA 8260 B	1,1-DICHLOROETHYLENE	FL
EPA 8260 B	1,1-DICHLOROPROPENE	FL	EPA 8260 B	1,2,3-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,3-TRICHLOROPROPANE	FL	EPA 8260 B	1,2,4-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,4-TRIMETHYLBENZENE	FL	EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	FL
EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	FL	EPA 8260 B	1,2-DICHLOROBENZENE	FL
EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	FL	EPA 8260 B	1,2-DICHLOROPROPANE	FL
EPA 8260 B	1,3,5-TRIMETHYLBENZENE	FL	EPA 8260 B	1,3-DICHLOROBENZENE	FL
EPA 8260 B	1,3-DICHLOROPROPANE	FL	EPA 8260 B	1,4-DICHLOROBENZENE	FL
EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	FL	EPA 8260 B	1-CHLOROHEXANE	FL
EPA 8260 B	2,2-DICHLOROPROPANE	FL			

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	FL	EPA 8260 B	2-CHLOROETHYL VINYL ETHER	FL
EPA 8260 B	2-CHLOROTOLUENE	FL	EPA 8260 B	2-HEXANONE	FL
EPA 8260 B	4-CHLOROTOLUENE	FL	EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	FL
EPA 8260 B	ACETONE	FL	EPA 8260 B	ACETONITRILE	FL
EPA 8260 B	ACROLEIN (PROPENAL)	FL	EPA 8260 B	ACRYLONITRILE	FL
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	FL	EPA 8260 B	BENZENE	FL
EPA 8260 B	BROMOBENZENE	FL	EPA 8260 B	BROMOCHLOROMETHANE	FL
EPA 8260 B	BROMODICHLOROMETHANE	FL	EPA 8260 B	BROMOFORM	FL
EPA 8260 B	CARBON DISULFIDE	FL	EPA 8260 B	CARBON TETRACHLORIDE	FL
EPA 8260 B	CHLOROBENZENE	FL	EPA 8260 B	CHLORODIBROMOMETHANE	FL
EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	FL	EPA 8260 B	CHLOROFORM	FL
EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	FL	EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	FL
EPA 8260 B	CIS-1,3-DICHLOROPROPENE	FL	EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	FL
EPA 8260 B	ETHYL METHACRYLATE	FL	EPA 8260 B	ETHYLBENZENE	FL
EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL	EPA 8260 B	IODOMETHANE (METHYL IODIDE)	FL
EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	FL	EPA 8260 B	ISOPROPYLBENZENE	FL
EPA 8260 B	METHACRYLONITRILE	FL	EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	FL
EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	FL	EPA 8260 B	METHYL METHACRYLATE	FL
EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	FL	EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	FL
EPA 8260 B	N-BUTYLBENZENE	FL	EPA 8260 B	N-PROPYLBENZENE	FL
EPA 8260 B	NAPHTHALENE	FL	EPA 8260 B	PENTACHLOROETHANE	FL
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	FL	EPA 8260 B	SEC-BUTYLBENZENE	FL
EPA 8260 B	STYRENE	FL	EPA 8260 B	TERT-BUTYLBENZENE	FL
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	FL	EPA 8260 B	TOLUENE	FL
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	FL	EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	FL	EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	FL
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	FL	EPA 8260 B	VINYL ACETATE	FL
EPA 8260 B	VINYL CHLORIDE	FL	EPA 8260 B	XYLENE (TOTAL)	FL
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	FL	EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	FL
EPA 8270 D	1,2,4-TRICHLOROBENZENE	FL	EPA 8270 D	1,2-DICHLOROBENZENE	FL

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	1,2-DIPHENYLHYDRAZINE	FL	EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8270 D	1,3-DICHLOROBENZENE	FL	EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8270 D	1,4-DICHLOROBENZENE	FL	EPA 8270 D	1,4-NAPHTHOQUINONE	FL
EPA 8270 D	1,4-PHENYLENEDIAMINE	FL	EPA 8270 D	1-NAPHTHYLAMINE	FL
EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	FL	EPA 8270 D	2,4,5-TRICHLOROPHENOL	FL
EPA 8270 D	2,4,6-TRICHLOROPHENOL	FL	EPA 8270 D	2,4-DICHLOROPHENOL	FL
EPA 8270 D	2,4-DIMETHYLPHENOL	FL	EPA 8270 D	2,4-DINITROPHENOL	FL
EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	FL	EPA 8270 D	2,6-DICHLOROPHENOL	FL
EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	FL	EPA 8270 D	2-ACETYLAMINOFLUORENE	FL
EPA 8270 D	2-CHLORONAPHTHALENE	FL	EPA 8270 D	2-CHLOROPHENOL	FL
EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	FL	EPA 8270 D	2-METHYLNAPHTHALENE	FL
EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	FL	EPA 8270 D	2-NAPHTHYLAMINE	FL
EPA 8270 D	2-NITROANILINE	FL	EPA 8270 D	2-NITROPHENOL	FL
EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	FL	EPA 8270 D	3,3'-DICHLOROBENZIDINE	FL
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	FL	EPA 8270 D	3-METHYLCHOLANTHRENE	FL
EPA 8270 D	3-NITROANILINE	FL	EPA 8270 D	4-AMINOBIPHENYL	FL
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	FL	EPA 8270 D	4-CHLORO-3-METHYLPHENOL	FL
EPA 8270 D	4-CHLOROANILINE	FL	EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	FL
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	FL	EPA 8270 D	4-NITROANILINE	FL
EPA 8270 D	4-NITROPHENOL	FL	EPA 8270 D	5-NITRO-O-TOLUIDINE	FL
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	FL	EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	FL
EPA 8270 D	ACENAPHTHENE	FL	EPA 8270 D	ACENAPHTHYLENE	FL
EPA 8270 D	ACETOPHENONE	FL	EPA 8270 D	ANILINE	FL
EPA 8270 D	ANTHRACENE	FL	EPA 8270 D	ARAMITE	FL
EPA 8270 D	BENZIDINE	FL	EPA 8270 D	BENZO(A)ANTHRACENE	FL
EPA 8270 D	BENZO(A)PYRENE	FL	EPA 8270 D	BENZO(B)FLUORANTHENE	FL
EPA 8270 D	BENZO(G,H,I)PERYLENE	FL	EPA 8270 D	BENZO(K)FLUORANTHENE	FL
EPA 8270 D	BENZOIC ACID	FL	EPA 8270 D	BENZYL ALCOHOL	FL
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	FL	EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	FL
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	FL	EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	FL
EPA 8270 D	BUTYL BENZYL PHTHALATE	FL	EPA 8270 D	CHLOROBENZILATE	FL
EPA 8270 D	CHRYSENE	FL	EPA 8270 D	DI-N-BUTYL PHTHALATE	FL
EPA 8270 D	DI-N-OCTYL PHTHALATE	FL	EPA 8270 D	DIALLATE	FL
EPA 8270 D	DIBENZO(A,H) ANTHRACENE	FL	EPA 8270 D	DIBENZOFURAN	FL
EPA 8270 D	DIETHYL PHTHALATE	FL	EPA 8270 D	DIMETHOATE	FL
EPA 8270 D	DIMETHYL PHTHALATE	FL			

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	DISULFOTON	FL	EPA 8270 D	ETHYL METHANESULFONATE	FL
EPA 8270 D	FAMPHUR	FL	EPA 8270 D	FLUORANTHENE	FL
EPA 8270 D	FLUORENE	FL	EPA 8270 D	HEXACHLOROBENZENE	FL
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL	EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	FL
EPA 8270 D	HEXACHLOROETHANE	FL	EPA 8270 D	HEXACHLOROPHENE	FL
EPA 8270 D	HEXACHLOROPROPENE	FL	EPA 8270 D	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D	ISODRIN	FL	EPA 8270 D	ISOPHORONE	FL
EPA 8270 D	ISOSAFROLE	FL	EPA 8270 D	KEPONE	FL
EPA 8270 D	METHAPYRILENE	FL	EPA 8270 D	METHYL METHANESULFONATE	FL
EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	FL	EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	FL
EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	FL	EPA 8270 D	N-NITROSODIETHYLAMINE	FL
EPA 8270 D	N-NITROSODIMETHYLAMINE	FL	EPA 8270 D	N-NITROSODIPHENYLAMINE	FL
EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	FL	EPA 8270 D	N-NITROSOMORPHOLINE	FL
EPA 8270 D	N-NITROSOPIPERIDINE	FL	EPA 8270 D	N-NITROSOPYRROLIDINE	FL
EPA 8270 D	NAPHTHALENE	FL	EPA 8270 D	NITROBENZENE	FL
EPA 8270 D	NITROQUINOLINE-1-OXIDE	FL	EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	FL
EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	FL	EPA 8270 D	PARATHION (PARATHION - ETHYL)	FL
EPA 8270 D	PENTACHLOROBENZENE	FL	EPA 8270 D	PENTACHLORONITROBENZENE	FL
EPA 8270 D	PENTACHLOROPHENOL	FL	EPA 8270 D	PHENACETIN	FL
EPA 8270 D	PHENANTHRENE	FL	EPA 8270 D	PHENOL	FL
EPA 8270 D	PHORATE	FL	EPA 8270 D	PRONAMIDE (KERB)	FL
EPA 8270 D	PYRENE	FL	EPA 8270 D	SAFROLE	FL
EPA 8270 D	SULFOTEPP (TETRAETHYL DITHIOPYROPHOSPHATE)	FL	EPA 8270 D	THIONAZIN (ZINOPHOS)	FL
EPA 8270 D - EXTENDED	2,2'-OXYBIS(1-CHLOROPROPANE)	FL	EPA 8270 D - EXTENDED	3+4-METHYL PHENOL (M+P CRESOL)	FL
EPA 8270 D - EXTENDED	CARBAZOLE	FL	EPA 8270 D - EXTENDED	PYRIDINE	FL
EPA 8270 D SIM	2-METHYLNAPHTHALENE	FL	EPA 8270 D SIM	ACENAPHTHENE	FL
EPA 8270 D SIM	ACENAPHTHYLENE	FL	EPA 8270 D SIM	ANTHRACENE	FL
EPA 8270 D SIM	BENZO(A)ANTHRACENE	FL	EPA 8270 D SIM	BENZO(A)PYRENE	FL
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	FL	EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	FL	EPA 8270 D SIM	CHRYSENE	FL
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	FL	EPA 8270 D SIM	FLUORANTHENE	FL
EPA 8270 D SIM	FLUORENE	FL	EPA 8270 D SIM	HEXACHLOROBENZENE	FL
EPA 8270 D SIM	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL	EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D SIM	NAPHTHALENE	FL	EPA 8270 D SIM	PENTACHLOROPHENOL	FL
EPA 8270 D SIM	PHENANTHRENE	FL	EPA 8270 D SIM	PYRENE	FL

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8310	ACENAPHTHENE	FL	EPA 8310	ACENAPHTHYLENE	FL
EPA 8310	ANTHRACENE	FL	EPA 8310	BENZO(A)ANTHRACENE	FL
EPA 8310	BENZO(A)PYRENE	FL	EPA 8310	BENZO(B)FLUORANTHENE	FL
EPA 8310	BENZO(G,H,I)PERYLENE	FL	EPA 8310	BENZO(K)FLUORANTHENE	FL
EPA 8310	CHRYSENE	FL	EPA 8310	DIBENZO(A,H) ANTHRACENE	FL
EPA 8310	FLUORANTHENE	FL	EPA 8310	FLUORENE	FL
EPA 8310	INDENO(1,2,3-CD) PYRENE	FL	EPA 8310	NAPHTHALENE	FL
EPA 8310	PHENANTHRENE	FL	EPA 8310	PYRENE	FL
EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL	EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL	EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	FL	EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL
EPA 8330 A	2-NITROTOLUENE	FL	EPA 8330 A	3-NITROTOLUENE	FL
EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL	EPA 8330 A	4-NITROTOLUENE	FL
EPA 8330 A	NITROBENZENE	FL	EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1 ,3,5,7-TETRAZOCINE (HMX)	FL
EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL	EPA 8330 B	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8330 B	1,3-DINITROBENZENE (1,3-DNB)	FL	EPA 8330 B	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL
EPA 8330 B	2,4-DINITROTOLUENE (2,4-DNT)	FL	EPA 8330 B	2,6-DINITROTOLUENE (2,6-DNT)	FL
EPA 8330 B	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL	EPA 8330 B	2-NITROTOLUENE	FL
EPA 8330 B	3-NITROTOLUENE	FL	EPA 8330 B	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL
EPA 8330 B	4-NITROTOLUENE	FL	EPA 8330 B	NITROBENZENE	FL
EPA 8330 B	OCTAHYDRO-1,3,5,7-TETRANITRO-1 ,3,5,7-TETRAZOCINE (HMX)	FL	EPA 8330 B	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL
EPA 8332	NITROGLYCERIN	FL	EPA 9010 B	PREP: CYANIDE DISTILLATION	FL
EPA 9010 C	PREP: CYANIDE DISTILLATION	FL	EPA 9012 A	AMENABLE CYANIDE	FL
EPA 9012 A	TOTAL CYANIDE	FL	EPA 9012 B	AMENABLE CYANIDE	FL
EPA 9012 B	TOTAL CYANIDE	FL	EPA 9040 B	PH	FL
EPA 9040 C	PH	FL	SM 2540 B-2011	RESIDUE-TOTAL	FL
SM 2540 C-2011	RESIDUE-FILTERABLE (TDS)	FL	SM 2540 D-2011	RESIDUE-NONFILTERABLE (TSS)	FL
SM 3500-CR B-2011	CHROMIUM VI	FL	SM 4500-CN^- G-2011	AMENABLE CYANIDE	FL
SM 4500-$S2^-$ F-2011	SULFIDE	FL	SM 5310 B-2011	TOTAL ORGANIC CARBON	FL

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	FL			

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EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	FL	EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	FL
EPA 6010 C	ALUMINUM	FL	EPA 6010 C	ANTIMONY	FL
EPA 6010 C	ARSENIC	FL	EPA 6010 C	BARIUM	FL
EPA 6010 C	BERYLLIUM	FL	EPA 6010 C	BORON	FL
EPA 6010 C	CADMIUM	FL	EPA 6010 C	CALCIUM	FL
EPA 6010 C	CHROMIUM	FL	EPA 6010 C	COBALT	FL
EPA 6010 C	COPPER	FL	EPA 6010 C	IRON	FL
EPA 6010 C	LEAD	FL	EPA 6010 C	MAGNESIUM	FL
EPA 6010 C	MANGANESE	FL	EPA 6010 C	MOLYBDENUM	FL
EPA 6010 C	NICKEL	FL	EPA 6010 C	POTASSIUM	FL
EPA 6010 C	SELENIUM	FL	EPA 6010 C	SILVER	FL
EPA 6010 C	SODIUM	FL	EPA 6010 C	THALLIUM	FL
EPA 6010 C	TIN	FL	EPA 6010 C	TITANIUM	FL
EPA 6010 C	VANADIUM	FL	EPA 6010 C	ZINC	FL
EPA 6020 A	ANTIMONY	FL	EPA 6020 A	ARSENIC	FL
EPA 6020 A	BARIUM	FL	EPA 6020 A	BERYLLIUM	FL
EPA 6020 A	CADMIUM	FL	EPA 6020 A	CHROMIUM	FL
EPA 6020 A	COBALT	FL	EPA 6020 A	COPPER	FL
EPA 6020 A	LEAD	FL	EPA 6020 A	MANGANESE	FL
EPA 6020 A	NICKEL	FL	EPA 6020 A	SELENIUM	FL
EPA 6020 A	SILVER	FL	EPA 6020 A	THALLIUM	FL
EPA 6020 A	VANADIUM	FL	EPA 6020 A	ZINC	FL
EPA 7196 A	CHROMIUM VI	FL	EPA 7471 A	MERCURY	FL
EPA 7471 B	MERCURY	FL	EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	FL
EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	FL	EPA 8081 B	4,4'-DDD	FL
EPA 8081 B	4,4'-DDE	FL	EPA 8081 B	4,4'-DDT	FL
EPA 8081 B	ALDRIN	FL	EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	FL	EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	CHLORDANE (TECH.)	FL	EPA 8081 B	DELTA-BHC	FL
EPA 8081 B	DIELDRIN	FL	EPA 8081 B	ENDOSULFAN I	FL
EPA 8081 B	ENDOSULFAN II	FL	EPA 8081 B	ENDOSULFAN SULFATE	FL
EPA 8081 B	ENDRIN	FL	EPA 8081 B	ENDRIN ALDEHYDE	FL
EPA 8081 B	ENDRIN KETONE	FL	EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	FL

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EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	FL	EPA 8081 B	HEPTACHLOR	FL
EPA 8081 B	HEPTACHLOR EPOXIDE	FL	EPA 8081 B	METHOXYCHLOR	FL
EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	FL	EPA 8082 A	AROCLOR-1016 (PCB-1016)	FL
EPA 8082 A	AROCLOR-1221 (PCB-1221)	FL	EPA 8082 A	AROCLOR-1232 (PCB-1232)	FL
EPA 8082 A	AROCLOR-1242 (PCB-1242)	FL	EPA 8082 A	AROCLOR-1248 (PCB-1248)	FL
EPA 8082 A	AROCLOR-1254 (PCB-1254)	FL	EPA 8082 A	AROCLOR-1260 (PCB-1260)	FL
EPA 8151 A	2,4,5-T	FL	EPA 8151 A	2,4-D	FL
EPA 8151 A	2,4-DB	FL	EPA 8151 A	4-NITROPHENOL	FL
EPA 8151 A	DALAPON	FL	EPA 8151 A	DICAMBA	FL
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	FL	EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	FL
EPA 8151 A	PENTACHLOROPHENOL	FL	EPA 8151 A	SILVEX (2,4,5-TP)	FL
EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	FL	EPA 8260 B	1,1,1-TRICHLOROETHANE	FL
EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	FL	EPA 8260 B	1,1,2-TRICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHANE	FL	EPA 8260 B	1,1-DICHLOROETHYLENE	FL
EPA 8260 B	1,1-DICHLOROPROPENE	FL	EPA 8260 B	1,2,3-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,3-TRICHLOROPROPANE	FL	EPA 8260 B	1,2,4-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,4-TRIMETHYLBENZENE	FL	EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	FL
EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	FL	EPA 8260 B	1,2-DICHLOROBENZENE	FL
EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	FL	EPA 8260 B	1,2-DICHLOROPROPANE	FL
EPA 8260 B	1,3,5-TRIMETHYLBENZENE	FL	EPA 8260 B	1,3-DICHLOROBENZENE	FL
EPA 8260 B	1,3-DICHLOROPROPANE	FL	EPA 8260 B	1,4-DICHLOROBENZENE	FL
EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	FL	EPA 8260 B	1-CHLOROHEXANE	FL
EPA 8260 B	2,2-DICHLOROPROPANE	FL	EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	FL
EPA 8260 B	2-CHLOROETHYL VINYL ETHER	FL	EPA 8260 B	2-CHLOROTOLUENE	FL
EPA 8260 B	2-HEXANONE	FL	EPA 8260 B	4-CHLOROTOLUENE	FL
EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	FL	EPA 8260 B	ACETONE	FL
EPA 8260 B	ACETONITRILE	FL	EPA 8260 B	ACROLEIN (PROPENAL)	FL
EPA 8260 B	ACRYLONITRILE	FL	EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	FL
EPA 8260 B	BENZENE	FL	EPA 8260 B	BROMOBENZENE	FL
EPA 8260 B	BROMOCHLOROMETHANE	FL	EPA 8260 B	BROMODICHLOROMETHANE	FL
EPA 8260 B	BROMOFORM	FL	EPA 8260 B	CARBON DISULFIDE	FL
EPA 8260 B	CARBON TETRACHLORIDE	FL	EPA 8260 B	CHLOROBENZENE	FL

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EPA 8260 B	CHLORODIBROMOMETHANE	FL	EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	FL
EPA 8260 B	CHLOROFORM	FL	EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	FL
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	FL	EPA 8260 B	CIS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	FL	EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	FL
EPA 8260 B	ETHYL METHACRYLATE	FL	EPA 8260 B	ETHYLBENZENE	FL
EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL	EPA 8260 B	IODOMETHANE (METHYL IODIDE)	FL
EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	FL	EPA 8260 B	ISOPROPYLBENZENE	FL
EPA 8260 B	METHACRYLONITRILE	FL	EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	FL
EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	FL	EPA 8260 B	METHYL METHACRYLATE	FL
EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	FL	EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	FL
EPA 8260 B	N-BUTYLBENZENE	FL	EPA 8260 B	N-PROPYLBENZENE	FL
EPA 8260 B	NAPHTHALENE	FL	EPA 8260 B	PENTACHLOROETHANE	FL
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	FL	EPA 8260 B	SEC-BUTYLBENZENE	FL
EPA 8260 B	STYRENE	FL	EPA 8260 B	TERT-BUTYLBENZENE	FL
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	FL	EPA 8260 B	TOLUENE	FL
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	FL	EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	FL	EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	FL
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	FL	EPA 8260 B	VINYL ACETATE	FL
EPA 8260 B	VINYL CHLORIDE	FL	EPA 8260 B	XYLENE (TOTAL)	FL
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	FL	EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	FL
EPA 8270 D	1,2,4-TRICHLOROBENZENE	FL	EPA 8270 D	1,2-DICHLOROBENZENE	FL
EPA 8270 D	1,2-DIPHENYLHYDRAZINE	FL	EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8270 D	1,3-DICHLOROBENZENE	FL	EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8270 D	1,4-DICHLOROBENZENE	FL	EPA 8270 D	1,4-NAPHTHOQUINONE	FL
EPA 8270 D	1,4-PHENYLENEDIAMINE	FL	EPA 8270 D	1-NAPHTHYLAMINE	FL
EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	FL	EPA 8270 D	2,4,5-TRICHLOROPHENOL	FL
EPA 8270 D	2,4,6-TRICHLOROPHENOL	FL	EPA 8270 D	2,4-DICHLOROPHENOL	FL
EPA 8270 D	2,4-DIMETHYLPHENOL	FL	EPA 8270 D	2,4-DINITROPHENOL	FL
EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	FL	EPA 8270 D	2,6-DICHLOROPHENOL	FL
EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	FL	EPA 8270 D	2-ACETYLAMINOFLUORENE	FL
EPA 8270 D	2-CHLORONAPHTHALENE	FL	EPA 8270 D	2-CHLOROPHENOL	FL

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EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	FL	EPA 8270 D	2-METHYLNAPHTHALENE	FL
EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	FL	EPA 8270 D	2-NAPHTHYLAMINE	FL
EPA 8270 D	2-NITROANILINE	FL	EPA 8270 D	2-NITROPHENOL	FL
EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	FL	EPA 8270 D	3,3'-DICHLOROBENZIDINE	FL
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	FL	EPA 8270 D	3-METHYLCHOLANTHRENE	FL
EPA 8270 D	3-NITROANILINE	FL	EPA 8270 D	4-AMINOBIPHENYL	FL
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	FL	EPA 8270 D	4-CHLORO-3-METHYLPHENOL	FL
EPA 8270 D	4-CHLOROANILINE	FL	EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	FL
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	FL	EPA 8270 D	4-METHYLPHENOL (P-CRESOL)	FL
EPA 8270 D	4-NITROANILINE	FL	EPA 8270 D	4-NITROPHENOL	FL
EPA 8270 D	5-NITRO-O-TOLUIDINE	FL	EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	FL
EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	FL	EPA 8270 D	ACENAPHTHENE	FL
EPA 8270 D	ACENAPHTHYLENE	FL	EPA 8270 D	ACETOPHENONE	FL
EPA 8270 D	ANILINE	FL	EPA 8270 D	ANTHRACENE	FL
EPA 8270 D	ARAMITE	FL	EPA 8270 D	BENZIDINE	FL
EPA 8270 D	BENZO(A)ANTHRACENE	FL	EPA 8270 D	BENZO(A)PYRENE	FL
EPA 8270 D	BENZO(B)FLUORANTHENE	FL	EPA 8270 D	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D	BENZO(K)FLUORANTHENE	FL	EPA 8270 D	BENZOIC ACID	FL
EPA 8270 D	BENZYL ALCOHOL	FL	EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	FL
EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	FL	EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	FL
EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	FL	EPA 8270 D	BUTYL BENZYL PHTHALATE	FL
EPA 8270 D	CHLOROBENZILATE	FL	EPA 8270 D	CHRYSENE	FL
EPA 8270 D	DI-N-BUTYL PHTHALATE	FL	EPA 8270 D	DI-N-OCTYL PHTHALATE	FL
EPA 8270 D	DIALLATE	FL	EPA 8270 D	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D	DIBENZOFURAN	FL	EPA 8270 D	DIETHYL PHTHALATE	FL
EPA 8270 D	DIMETHOATE	FL	EPA 8270 D	DIMETHYL PHTHALATE	FL
EPA 8270 D	DISULFOTON	FL	EPA 8270 D	ETHYL METHANESULFONATE	FL
EPA 8270 D	FAMPHUR	FL	EPA 8270 D	FLUORANTHENE	FL
EPA 8270 D	FLUORENE	FL	EPA 8270 D	HEXACHLOROBENZENE	FL
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL	EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	FL
EPA 8270 D	HEXACHLOROETHANE	FL	EPA 8270 D	HEXACHLOROPHENE	FL
EPA 8270 D	HEXACHLOROPROPENE	FL	EPA 8270 D	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D	ISODRIN	FL	EPA 8270 D	ISOPHORONE	FL
EPA 8270 D	ISOSAFROLE	FL	EPA 8270 D	KEPONE	FL
EPA 8270 D	METHAPYRILENE	FL	EPA 8270 D	METHYL METHANESULFONATE	FL

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EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	FL
EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	FL
EPA 8270 D	N-NITROSODIMETHYLAMINE	FL
EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	FL
EPA 8270 D	N-NITROSOPIPERIDINE	FL
EPA 8270 D	NAPHTHALENE	FL
EPA 8270 D	NITROQUINOLINE-1-OXIDE	FL
EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	FL
EPA 8270 D	PENTACHLOROBENZENE	FL
EPA 8270 D	PENTACHLOROPHENOL	FL
EPA 8270 D	PHENANTHRENE	FL
EPA 8270 D	PHORATE	FL
EPA 8270 D	PYRENE	FL
EPA 8270 D	SULFOTEPP (TETRAETHYL DITHIOPYROPHOSPHATE)	FL
EPA 8270 D - EXTENDED	2,2'-OXYBIS(1-CHLOROPROPANE)	FL
EPA 8270 D - EXTENDED	CARBAZOLE	FL
EPA 8270 D SIM	2-METHYLNAPHTHALENE	FL
EPA 8270 D SIM	ACENAPHTHYLENE	FL
EPA 8270 D SIM	BENZO(A)ANTHRACENE	FL
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	FL
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	FL
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D SIM	FLUORENE	FL
EPA 8270 D SIM	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL
EPA 8270 D SIM	NAPHTHALENE	FL
EPA 8270 D SIM	PHENANTHRENE	FL
EPA 8310	ACENAPHTHENE	FL
EPA 8310	ANTHRACENE	FL
EPA 8310	BENZO(A)PYRENE	FL
EPA 8310	BENZO(G,H,I)PERYLENE	FL
EPA 8310	CHRYSENE	FL
EPA 8310	FLUORANTHENE	FL
EPA 8310	INDENO(1,2,3-CD) PYRENE	FL
EPA 8310	PHENANTHRENE	FL
EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	FL
EPA 8270 D	N-NITROSODIETHYLAMINE	FL
EPA 8270 D	N-NITROSODIPHENYLAMINE	FL
EPA 8270 D	N-NITROSOMORPHOLINE	FL
EPA 8270 D	N-NITROSOPYRROLIDINE	FL
EPA 8270 D	NITROBENZENE	FL
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	FL
EPA 8270 D	PARATHION (PARATHION - ETHYL)	FL
EPA 8270 D	PENTACHLORONITROBENZENE	FL
EPA 8270 D	PHENACETIN	FL
EPA 8270 D	PHENOL	FL
EPA 8270 D	PRONAMIDE (KERB)	FL
EPA 8270 D	SAFROLE	FL
EPA 8270 D	THIONAZIN (ZINOPHOS)	FL
EPA 8270 D - EXTENDED	3+4-METHYL PHENOL (M+P CRESOL)	FL
EPA 8270 D - EXTENDED	PYRIDINE	FL
EPA 8270 D SIM	ACENAPHTHENE	FL
EPA 8270 D SIM	ANTHRACENE	FL
EPA 8270 D SIM	BENZO(A)PYRENE	FL
EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D SIM	CHRYSENE	FL
EPA 8270 D SIM	FLUORANTHENE	FL
EPA 8270 D SIM	HEXACHLOROBENZENE	FL
EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D SIM	PENTACHLOROPHENOL	FL
EPA 8270 D SIM	PYRENE	FL
EPA 8310	ACENAPHTHYLENE	FL
EPA 8310	BENZO(A)ANTHRACENE	FL
EPA 8310	BENZO(B)FLUORANTHENE	FL
EPA 8310	BENZO(K)FLUORANTHENE	FL
EPA 8310	DIBENZO(A,H) ANTHRACENE	FL
EPA 8310	FLUORENE	FL
EPA 8310	NAPHTHALENE	FL
EPA 8310	PYRENE	FL
EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	FL

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 6537

Compuchem, A Division of Liberty Analytical
501 Madison Avenue
Cary, NC 27513

Virginia Laboratory ID: 460188
Effective Date: September 15, 2014
Expiration Date: September 14, 2015

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL	EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	FL	EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL
EPA 8330 A	2-NITROTOLUENE	FL	EPA 8330 A	3-NITROTOLUENE	FL
EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL	EPA 8330 A	4-NITROTOLUENE	FL
EPA 8330 A	NITROBENZENE	FL	EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1 ,3,5,7-TETRAZOCINE (HMX)	FL
EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL	EPA 8332	NITROGLYCERIN	FL
EPA 9010 B	CYANIDE	FL	EPA 9010 B	PREP: CYANIDE DISTILLATION	FL
EPA 9010 C	PREP: CYANIDE DISTILLATION	FL	EPA 9012 A	CYANIDE	FL
EPA 9012 B	TOTAL CYANIDE	FL	EPA 9045 C	PH	FL
EPA 9060 A	TOTAL ORGANIC CARBON	FL	EPA 9071 B	OIL AND GREASE (AS HEM)	FL

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
DIVISION OF CONSOLIDATED LABORATORY SERVICES

Certifies that

VA Laboratory ID#: 460182
EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC

2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Owner: EUROFINS SCIENTIFIC
Operator: J. WILSON HERSHEY
Responsible Official: J. WILSON HERSHEY

Having met the requirements of 1 VAC 30-46
and the National Environmental Laboratory Accreditation Conference 2003 Standard

is hereby approved as an

Accredited Laboratory

As more fully described in the attached Scope of Accreditation

Effective Date: **June 15, 2014**
Expiration Date: **June 14, 2015**
Certificate # 2914

Denise M. Toney, Ph.D.
DGS Deputy Director for Laboratories, Acting

Continued accreditation status depends on successful ongoing participation in the program.
Certificate to be conspicuously displayed at the laboratory.
Not valid unless accompanied by a valid Virginia Environmental Laboratory Accreditation Program (VELAP) Scope of Accreditation.
Customers are urged to verify the laboratory's current accreditation status.

Certificate Not Transferable

Surrender Upon Revocation

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

AIR

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA TO-14A REV 2	1,1,1-TRICHLOROETHANE	LA DEQ	EPA TO-14A REV 2	1,1,2,2-TETRACHLOROETHANE	LA DEQ
EPA TO-14A REV 2	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	LA DEQ	EPA TO-14A REV 2	1,1,2-TRICHLOROETHANE	LA DEQ
EPA TO-14A REV 2	1,1-DICHLOROETHANE	LA DEQ	EPA TO-14A REV 2	1,1-DICHLOROETHYLENE	LA DEQ
EPA TO-14A REV 2	1,2,4-TRICHLOROBENZENE	LA DEQ	EPA TO-14A REV 2	1,2,4-TRIMETHYLBENZENE	LA DEQ
EPA TO-14A REV 2	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	LA DEQ	EPA TO-14A REV 2	1,2-DICHLOROBENZENE	LA DEQ
EPA TO-14A REV 2	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	LA DEQ	EPA TO-14A REV 2	1,2-DICHLOROPROPANE	LA DEQ
EPA TO-14A REV 2	1,3,5-TRIMETHYLBENZENE	LA DEQ	EPA TO-14A REV 2	1,3-DICHLOROBENZENE	LA DEQ
EPA TO-14A REV 2	1,4-DICHLOROBENZENE	LA DEQ	EPA TO-14A REV 2	2-BUTANONE (METHYL ETHYL KETONE, MEK)	LA DEQ
EPA TO-14A REV 2	BENZENE	LA DEQ	EPA TO-14A REV 2	BROMOFORM	LA DEQ
EPA TO-14A REV 2	CARBON TETRACHLORIDE	LA DEQ	EPA TO-14A REV 2	CHLOROBENZENE	LA DEQ
EPA TO-14A REV 2	CHLOROETHANE (ETHYL CHLORIDE)	LA DEQ	EPA TO-14A REV 2	CHLOROFORM	LA DEQ
EPA TO-14A REV 2	CIS-1,2-DICHLOROETHYLENE	LA DEQ	EPA TO-14A REV 2	CIS-1,3-DICHLOROPROPENE	LA DEQ
EPA TO-14A REV 2	ETHYLBENZENE	LA DEQ	EPA TO-14A REV 2	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	LA DEQ
EPA TO-14A REV 2	M+P-XYLENE	LA DEQ	EPA TO-14A REV 2	METHYL BROMIDE (BROMOMETHANE)	LA DEQ
EPA TO-14A REV 2	METHYL CHLORIDE (CHLOROMETHANE)	LA DEQ	EPA TO-14A REV 2	METHYLENE CHLORIDE (DICHLOROMETHANE)	LA DEQ
EPA TO-14A REV 2	O-XYLENE	LA DEQ	EPA TO-14A REV 2	STYRENE	LA DEQ
EPA TO-14A REV 2	TETRACHLOROETHENE (PERCHLOROETHENE)	LA DEQ	EPA TO-14A REV 2	TOLUENE	LA DEQ
EPA TO-14A REV 2	TRANS-1,2-DICHLOROETHENE	LA DEQ	EPA TO-14A REV 2	TRANS-1,3-DICHLOROPROPENE	LA DEQ
EPA TO-14A REV 2	TRICHLOROETHENE (TRICHLOROETHYLENE)	LA DEQ	EPA TO-14A REV 2	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	LA DEQ
EPA TO-14A REV 2	VINYL CHLORIDE	LA DEQ	EPA TO-14A REV 2 - EXTENDED	4-METHYL-2-PENTANONE (MIBK)	LA DEQ
EPA TO-14A REV 2 - EXTENDED	BROMODICHLOROMETHANE	LA DEQ	EPA TO-14A REV 2 - EXTENDED	CARBON DISULFIDE	LA DEQ
EPA TO-14A REV 2 - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	LA DEQ	EPA TO-14A REV 2 - EXTENDED	XYLENE (TOTAL)	LA DEQ
EPA TO-15	1,1,1-TRICHLOROETHANE	LA DEQ	EPA TO-15	1,1,2,2-TETRACHLOROETHANE	LA DEQ
EPA TO-15	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	LA DEQ	EPA TO-15	1,1,2-TRICHLOROETHANE	LA DEQ
EPA TO-15	1,1-DICHLOROETHANE	LA DEQ	EPA TO-15	1,1-DICHLOROETHYLENE	LA DEQ
EPA TO-15	1,2,4-TRICHLOROBENZENE	LA DEQ	EPA TO-15	1,2,4-TRIMETHYLBENZENE	LA DEQ
EPA TO-15	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	LA DEQ	EPA TO-15	1,2-DICHLOROBENZENE	LA DEQ
EPA TO-15	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	LA DEQ	EPA TO-15	1,2-DICHLOROPROPANE	LA DEQ
EPA TO-15	1,3,5-TRIMETHYLBENZENE	LA DEQ	EPA TO-15	1,3-BUTADIENE	LA DEQ

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

AIR

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA TO-15	1,3-DICHLOROBENZENE	LA DEQ	EPA TO-15	1,4-DICHLOROBENZENE	LA DEQ
EPA TO-15	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	LA DEQ	EPA TO-15	2-BUTANONE (METHYL ETHYL KETONE, MEK)	LA DEQ
EPA TO-15	4-METHYL-2-PENTANONE (MIBK)	LA DEQ	EPA TO-15	ACETONITRILE	LA DEQ
EPA TO-15	ACROLEIN (PROPENAL)	LA DEQ	EPA TO-15	ACRYLONITRILE	LA DEQ
EPA TO-15	ALLYL CHLORIDE (3-CHLOROPROPENE)	LA DEQ	EPA TO-15	BENZENE	LA DEQ
EPA TO-15	BROMODICHLOROMETHANE	LA DEQ	EPA TO-15	BROMOFORM	LA DEQ
EPA TO-15	CARBON DISULFIDE	LA DEQ	EPA TO-15	CARBON TETRACHLORIDE	LA DEQ
EPA TO-15	CHLOROBENZENE	LA DEQ	EPA TO-15	CHLOROETHANE (ETHYL CHLORIDE)	LA DEQ
EPA TO-15	CHLOROFORM	LA DEQ	EPA TO-15	CIS-1,2-DICHLOROETHYLENE	LA DEQ
EPA TO-15	CIS-1,3-DICHLOROPROPENE	LA DEQ	EPA TO-15	CYCLOHEXANE	LA DEQ
EPA TO-15	ETHYL ACRYLATE	LA DEQ	EPA TO-15	ETHYLBENZENE	LA DEQ
EPA TO-15	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	LA DEQ	EPA TO-15	HEXACHLOROETHANE	LA DEQ
EPA TO-15	IODOMETHANE (METHYL IODIDE)	LA DEQ	EPA TO-15	ISOPROPYLBENZENE	LA DEQ
EPA TO-15	M+P-XYLENE	LA DEQ	EPA TO-15	METHYL BROMIDE (BROMOMETHANE)	LA DEQ
EPA TO-15	METHYL CHLORIDE (CHLOROMETHANE)	LA DEQ	EPA TO-15	METHYL METHACRYLATE	LA DEQ
EPA TO-15	METHYL TERT-BUTYL ETHER (MTBE)	LA DEQ	EPA TO-15	METHYLENE CHLORIDE (DICHLOROMETHANE)	LA DEQ
EPA TO-15	O-XYLENE	LA DEQ	EPA TO-15	PROPYLENE	LA DEQ
EPA TO-15	STYRENE	LA DEQ	EPA TO-15	TETRACHLOROETHENE (PERCHLOROETHENE)	LA DEQ
EPA TO-15	TOLUENE	LA DEQ	EPA TO-15	TRANS-1,2-DICHLOROETHENE	LA DEQ
EPA TO-15	TRANS-1,3-DICHLOROPROPENE	LA DEQ	EPA TO-15	TRICHLOROETHENE (TRICHLOROETHYLENE)	LA DEQ
EPA TO-15	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	LA DEQ	EPA TO-15	VINYL ACETATE	LA DEQ
EPA TO-15	VINYL CHLORIDE	LA DEQ	EPA TO-15	XYLENE (TOTAL)	LA DEQ
EPA TO-15 - EXTENDED	2-CHLOROTOLUENE	LA DEQ	EPA TO-15 - EXTENDED	2-HEXANONE	LA DEQ
EPA TO-15 - EXTENDED	4-ETHYLTOLUENE	LA DEQ	EPA TO-15 - EXTENDED	ACETONE	LA DEQ
EPA TO-15 - EXTENDED	CHLORODIFLUOROMETHANE (FREON-22)	LA DEQ	EPA TO-15 - EXTENDED	NAPHTHALENE	LA DEQ
EPA TO-15 - EXTENDED	TERT-BUTYL ALCOHOL	LA DEQ			

DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 180.1 REV 2	TURBIDITY	PA	EPA 200.7 REV 4.4	ALUMINUM	PA
EPA 200.7 REV 4.4	BARIUM	PA	EPA 200.7 REV 4.4	BERYLLIUM	PA
EPA 200.7 REV 4.4	CADMIUM	PA	EPA 200.7 REV 4.4	CALCIUM	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 200.7 REV 4.4	CHROMIUM	PA	EPA 200.7 REV 4.4	COPPER	PA
EPA 200.7 REV 4.4	IRON	PA	EPA 200.7 REV 4.4	MAGNESIUM	PA
EPA 200.7 REV 4.4	MANGANESE	PA	EPA 200.7 REV 4.4	NICKEL	PA
EPA 200.7 REV 4.4	SILVER	PA	EPA 200.7 REV 4.4	SODIUM	PA
EPA 200.7 REV 4.4	ZINC	PA	EPA 200.8 REV 5.4	ANTIMONY	PA
EPA 200.8 REV 5.4	ARSENIC	PA	EPA 200.8 REV 5.4	BERYLLIUM	PA
EPA 200.8 REV 5.4	CADMIUM	PA	EPA 200.8 REV 5.4	CHROMIUM	PA
EPA 200.8 REV 5.4	COPPER	PA	EPA 200.8 REV 5.4	LEAD	PA
EPA 200.8 REV 5.4	NICKEL	PA	EPA 200.8 REV 5.4	SELENIUM	PA
EPA 200.8 REV 5.4	THALLIUM	PA	EPA 245.1 REV 3	MERCURY	PA
EPA 300.0 REV 2.1	CHLORIDE	PA	EPA 300.0 REV 2.1	FLUORIDE	PA
EPA 300.0 REV 2.1	NITRATE AS N	PA	EPA 300.0 REV 2.1	NITRITE AS N	PA
EPA 300.0 REV 2.1	SULFATE	PA	EPA 335.4 REV 1.0	CYANIDE	PA
EPA 353.2 REV 2	NITRATE AS N	PA	EPA 353.2 REV 2	NITRATE/NITRITE	PA
EPA 353.2 REV 2	NITRITE AS N	PA	EPA 504.1 REV 1.1	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 504.1 REV 1.1	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 507 REV 2.1	ALACHLOR	PA
EPA 507 REV 2.1	ATRAZINE	PA	EPA 507 REV 2.1	SIMAZINE	PA
EPA 508 REV 3.1	AROCLOR-1016 (PCB-1016)	PA	EPA 508 REV 3.1	AROCLOR-1221 (PCB-1221)	PA
EPA 508 REV 3.1	AROCLOR-1232 (PCB-1232)	PA	EPA 508 REV 3.1	AROCLOR-1242 (PCB-1242)	PA
EPA 508 REV 3.1	AROCLOR-1248 (PCB-1248)	PA	EPA 508 REV 3.1	AROCLOR-1254 (PCB-1254)	PA
EPA 508 REV 3.1	AROCLOR-1260 (PCB-1260)	PA	EPA 508 REV 3.1	CHLORDANE (TECH.)	PA
EPA 508 REV 3.1	ENDRIN	PA	EPA 508 REV 3.1	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 508 REV 3.1	HEPTACHLOR	PA	EPA 508 REV 3.1	HEPTACHLOR EPOXIDE	PA
EPA 508 REV 3.1	HEXACHLOROBENZENE	PA	EPA 508 REV 3.1	HEXACHLOROCYCLOPENTADIENE	PA
EPA 508 REV 3.1	METHOXYCHLOR	PA	EPA 508 REV 3.1	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 515.1 REV 4	2,4-D	PA	EPA 515.1 REV 4	DALAPON	PA
EPA 515.1 REV 4	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 515.1 REV 4	PENTACHLOROPHENOL	PA
EPA 515.1 REV 4	PICLORAM	PA	EPA 515.1 REV 4	SILVEX (2,4,5-TP)	PA
EPA 524.2 REV 4.1	1,1,1-TRICHLOROETHANE	PA	EPA 524.2 REV 4.1	1,1,2-TRICHLOROETHANE	PA
EPA 524.2 REV 4.1	1,1-DICHLOROETHYLENE	PA	EPA 524.2 REV 4.1	1,2,4-TRICHLOROBENZENE	PA
EPA 524.2 REV 4.1	1,2-DICHLOROBENZENE	PA	EPA 524.2 REV 4.1	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 524.2 REV 4.1	1,2-DICHLOROPROPANE	PA	EPA 524.2 REV 4.1	1,4-DICHLOROBENZENE	PA
EPA 524.2 REV 4.1	BENZENE	PA	EPA 524.2 REV 4.1	BROMODICHLOROMETHANE	PA
EPA 524.2 REV 4.1	BROMOFORM	PA	EPA 524.2 REV 4.1	CARBON TETRACHLORIDE	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 524.2 REV 4.1	CHLOROBENZENE	PA	EPA 524.2 REV 4.1	CHLORODIBROMOMETHANE	PA
EPA 524.2 REV 4.1	CHLOROFORM	PA	EPA 524.2 REV 4.1	CIS-1,2-DICHLOROETHYLENE	PA
EPA 524.2 REV 4.1	ETHYLBENZENE	PA	EPA 524.2 REV 4.1	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 524.2 REV 4.1	STYRENE	PA	EPA 524.2 REV 4.1	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 524.2 REV 4.1	TOLUENE	PA	EPA 524.2 REV 4.1	TRANS-1,2-DICHLOROETHENE	PA
EPA 524.2 REV 4.1	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 524.2 REV 4.1	VINYL CHLORIDE	PA
EPA 524.2 REV 4.1	XYLENE (TOTAL)	PA	EPA 525.2 REV 2	ALACHLOR	PA
EPA 525.2 REV 2	ATRAZINE	PA	EPA 525.2 REV 2	BENZO(A)PYRENE	PA
EPA 525.2 REV 2	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA	EPA 525.2 REV 2	BIS(2-ETHYLHEXYL)ADIPATE (DI(2-ETHYLHEXYL)ADIPATE)	PA
EPA 525.2 REV 2	ENDRIN	PA	EPA 525.2 REV 2	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 525.2 REV 2	HEPTACHLOR	PA	EPA 525.2 REV 2	HEPTACHLOR EPOXIDE	PA
EPA 525.2 REV 2	HEXACHLOROBENZENE	PA	EPA 525.2 REV 2	HEXACHLOROCYCLOPENTADIENE	PA
EPA 525.2 REV 2	METHOXYCHLOR	PA	EPA 531.1 REV 3.1	CARBOFURAN (FURADEN)	PA
EPA 531.1 REV 3.1	OXAMYL	PA	SM 2320 B-1997	ALKALINITY AS CACO3	PA
SM 2510 B-1997	CONDUCTIVITY	PA	SM 2540 C-1997	RESIDUE-FILTERABLE (TDS)	PA
SM 4500-F⁻ C-1997	FLUORIDE	PA	SM 4500-H+ B-2000	PH	PA
SM 4500-P E-1999	ORTHOPHOSPHATE AS P	PA	SM 5540 C-2000	SURFACTANTS - MBAS	PA
SM 9215 B-1994	HETEROTROPHIC PLATE COUNT	PA	SM 9223 COLILERT P/A	ESCHERICHIA COLI	PA
SM 9223 COLILERT P/A	TOTAL COLIFORMS	PA			

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010	FLASHPOINT	PA	EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	PA
EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	PA	EPA 160.4	RESIDUE-VOLATILE	PA
EPA 1613 B	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA	EPA 1613 B	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA
EPA 1613 B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA	EPA 1613 B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA
EPA 1613 B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA	EPA 1613 B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA
EPA 1613 B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA	EPA 1613 B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA
EPA 1613 B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA	EPA 1613 B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA

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EPA 1613 B	1,2,3,7,8,9-HEXACHLORODIBENZO FURAN (1,2,3,7,8,9-HXCDF)	PA	EPA 1613 B	1,2,3,7,8-PENTACHLORODIBENZO -P-DIOXIN (1,2,3,7,8-PECDD)	PA
EPA 1613 B	1,2,3,7,8-PENTACHLORODIBENZO FURAN (1,2,3,7,8-PECDF)	PA	EPA 1613 B	2,3,4,6,7,8-HEXACHLORODIBENZO FURAN (2,3,4,6,7,8-HXCDF)	PA
EPA 1613 B	2,3,4,7,8-PENTACHLORODIBENZO FURAN	PA	EPA 1613 B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA
EPA 1613 B	2,3,7,8-TETRACHLORODIBENZOF URAN (2,3,7,8-TCDF)	PA	EPA 1631 E	MERCURY	PA
EPA 1664 A	OIL AND GREASE (AS HEM)	PA	EPA 1664 A	TOTAL PETROLEUM HYDROCARBONS (TPH) (AS NONPOLAR MATERIAL, SGT-HEM)	PA
EPA 1666 A	4-METHYL-2-PENTANONE (MIBK)	PA	EPA 1666 A	DI-ISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 1666 A	ETHYL ACETATE	PA	EPA 1666 A	ISOBUTYRALDEHYDE	PA
EPA 1666 A	ISOPROPYL ACETATE	PA	EPA 1666 A	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 1666 A	METHYL FORMATE	PA	EPA 1666 A	N-AMYL ACETATE	PA
EPA 1666 A	N-AMYL ALCOHOL	PA	EPA 1666 A	N-BUTYL-ACETATE	PA
EPA 1666 A	N-HEPTANE	PA	EPA 1666 A	N-HEXANE	PA
EPA 1666 A	TERT-BUTYL ALCOHOL	PA	EPA 1666 A	TETRAHYDROFURAN (THF)	PA
EPA 1666 A	XYLENE (TOTAL)	PA	EPA 1668 A	2,2',3,3',4,4',5,5',6-NONACHLOROBI PHENYL (BZ-206)	PA
EPA 1668 A	2,2',3,3',4,4',5,5'-OCTACHLOROBIP HENYL (BZ-194)	PA	EPA 1668 A	2,2',3,3',4,4',5,6'-OCTACHLOROBIP HENYL (BZ-196)	PA
EPA 1668 A	2,2',3,3',4,4',5,6,6'-NONACHLOROBI PHENYL (BZ-207)	PA	EPA 1668 A	2,2',3,3',4,4',5,6-OCTACHLOROBIP HENYL BZ-195)	PA
EPA 1668 A	2,2',3,3',4,4',5-HEPTACHLOROBIPH ENYL (BZ-170)	PA	EPA 1668 A	2,2',3,3',4,4',6,6'-OCTACHLOROBIP HENYL (BZ-197)	PA
EPA 1668 A	2,2',3,3',4,4',6-HEPTACHLOROBIPH ENYL (BZ-171)	PA	EPA 1668 A	2,2',3,3',4,4'-HEXACHLOROBIPHEN YL (BZ-128)	PA
EPA 1668 A	2,2',3,3',4,5',6'-HEPTACHLOROBIP HENYL (BZ-177)	PA	EPA 1668 A	2,2',3,3',4,5',6,6'-OCTACHLOROBIP HENYL (BZ-201)	PA
EPA 1668 A	2,2',3,3',4,5',6-HEPTACHLOROBIPH ENYL (BZ-175)	PA	EPA 1668 A	2,2',3,3',4,5'-HEXACHLOROBIPHEN YL (BZ-130)	PA
EPA 1668 A	2,2',3,3',4,5,5',6'-OCTACHLOROBIP HENYL (BZ-199)	PA	EPA 1668 A	2,2',3,3',4,5,5',6,6'-NONACHLOROBI PHENYL (BZ-208)	PA
EPA 1668 A	2,2',3,3',4,5,5',6-OCTACHLOROBIP HENYL (BZ-198)	PA	EPA 1668 A	2,2',3,3',4,5,5'-HEPTACHLOROBIPH ENYL (BZ-172)	PA
EPA 1668 A	2,2',3,3',4,5,6'-HEPTACHLOROBIPH ENYL (BZ-174)	PA	EPA 1668 A	2,2',3,3',4,5,6,6'-OCTACHLOROBIP HENYL (BZ-200)	PA
EPA 1668 A	2,2',3,3',4,5,6-HEPTACHLOROBIPH ENYL (BZ-173)	PA	EPA 1668 A	2,2',3,3',4,5-HEXACHLOROBIPHEN YL (BZ-129)	PA
EPA 1668 A	2,2',3,3',4,6'-HEXACHLOROBIPHEN YL (BZ-132)	PA	EPA 1668 A	2,2',3,3',4,6,6'-HEPTACHLOROBIPH ENYL (BZ-176)	PA
EPA 1668 A	2,2',3,3',4,6-HEXACHLOROBIPHEN YL (BZ-131)	PA	EPA 1668 A	2,2',3,3',4-PENTACHLOROBIPHEN YL (BZ-82)	PA
EPA 1668 A	2,2',3,3',5,5',6,6'-OCTACHLOROBIP HENYL (BZ-202)	PA	EPA 1668 A	2,2',3,3',5,5',6-HEPTACHLOROBIPH ENYL (BZ-178)	PA

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EPA 1668 A	2,2',3,3',5,5'-HEXACHLOROBIPHENYL (BZ-133)	PA	EPA 1668 A	2,2',3,3',5,6'-HEXACHLOROBIPHENYL (BZ-135)	PA
EPA 1668 A	2,2',3,3',5,6,6'-HEPTACHLOROBIPHENYL (BZ-179)	PA	EPA 1668 A	2,2',3,3',5,6-HEXACHLOROBIPHENYL (BZ-134)	PA
EPA 1668 A	2,2',3,3',5-PENTACHLOROBIPHENYL (BZ-83)	PA	EPA 1668 A	2,2',3,3',6,6'-HEXACHLOROBIPHENYL (BZ-136)	PA
EPA 1668 A	2,2',3,3',6-PENTACHLOROBIPHENYL (BZ-84)	PA	EPA 1668 A	2,2',3,3'-TETRACHLOROBIPHENYL (BZ-40)	PA
EPA 1668 A	2,2',3,4',5',6-HEXACHLOROBIPHENYL (BZ-149)	PA	EPA 1668 A	2,2',3,4',5'-PENTACHLOROBIPHENYL (BZ-97)	PA
EPA 1668 A	2,2',3,4',5,5',6-HEPTACHLOROBIPHENYL (BZ-187)	PA	EPA 1668 A	2,2',3,4',5,5'-HEXACHLOROBIPHENYL (BZ-146)	PA
EPA 1668 A	2,2',3,4',5,6'-HEXACHLOROBIPHENYL (BZ-148)	PA	EPA 1668 A	2,2',3,4',5,6,6'-HEPTACHLOROBIPHENYL (BZ-188)	PA
EPA 1668 A	2,2',3,4',5,6-HEXACHLOROBIPHENYL (BZ-147)	PA	EPA 1668 A	2,2',3,4',5-PENTACHLOROBIPHENYL (BZ-90)	PA
EPA 1668 A	2,2',3,4',6'-PENTACHLOROBIPHENYL (BZ-98)	PA	EPA 1668 A	2,2',3,4',6,6'-HEXACHLOROBIPHENYL (BZ-150)	PA
EPA 1668 A	2,2',3,4',6-PENTACHLOROBIPHENYL (BZ-91)	PA	EPA 1668 A	2,2',3,4'-TETRACHLOROBIPHENYL (BZ-42)	PA
EPA 1668 A	2,2',3,4,4',5',6-HEPTACHLOROBIPHENYL (BZ-183)	PA	EPA 1668 A	2,2',3,4,4',5'-HEXACHLOROBIPHENYL (BZ-138)	PA
EPA 1668 A	2,2',3,4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-203)	PA	EPA 1668 A	2,2',3,4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-180)	PA
EPA 1668 A	2,2',3,4,4',5,6'-HEPTACHLOROBIPHENYL (BZ-182)	PA	EPA 1668 A	2,2',3,4,4',5,6,6'-OCTACHLOROBIPHENYL (BZ-204)	PA
EPA 1668 A	2,2',3,4,4',5,6-HEPTACHLOROBIPHENYL (BZ-181)	PA	EPA 1668 A	2,2',3,4,4',5-HEXACHLOROBIPHENYL (BZ-137)	PA
EPA 1668 A	2,2',3,4,4',6'-HEXACHLOROBIPHENYL (BZ-140)	PA	EPA 1668 A	2,2',3,4,4',6,6'-HEPTACHLOROBIPHENYL (BZ-184)	PA
EPA 1668 A	2,2',3,4,4',6-HEXACHLOROBIPHENYL (BZ-139)	PA	EPA 1668 A	2,2',3,4,4'-PENTACHLOROBIPHENYL (BZ-85)	PA
EPA 1668 A	2,2',3,4,5',6-HEXACHLOROBIPHENYL (BZ-144)	PA	EPA 1668 A	2,2',3,4,5'-PENTACHLOROBIPHENYL (BZ-87)	PA
EPA 1668 A	2,2',3,4,5,5',6-HEPTACHLOROBIPHENYL (BZ-185)	PA	EPA 1668 A	2,2',3,4,5,5'-HEXACHLOROBIPHENYL (BZ-141)	PA
EPA 1668 A	2,2',3,4,5,6'-HEXACHLOROBIPHENYL (BZ-143)	PA	EPA 1668 A	2,2',3,4,5,6,6'-HEPTACHLOROBIPHENYL (BZ-186)	PA
EPA 1668 A	2,2',3,4,5,6-HEXACHLOROBIPHENYL (BZ-142)	PA	EPA 1668 A	2,2',3,4,5-PENTACHLOROBIPHENYL (BZ-86)	PA
EPA 1668 A	2,2',3,4,6'-PENTACHLOROBIPHENYL (BZ-89)	PA	EPA 1668 A	2,2',3,4,6,6'-HEXACHLOROBIPHENYL (BZ-145)	PA
EPA 1668 A	2,2',3,4,6-PENTACHLOROBIPHENYL (BZ-88)	PA	EPA 1668 A	2,2',3,4-TETRACHLOROBIPHENYL (BZ-41)	PA
EPA 1668 A	2,2',3,5',6-PENTACHLOROBIPHENYL (BZ-95)	PA	EPA 1668 A	2,2',3,5'-TETRACHLOROBIPHENYL (BZ-44)	PA
EPA 1668 A	2,2',3,5,5',6-HEXACHLOROBIPHENYL (BZ-151)	PA	EPA 1668 A	2,2',3,5,5'-PENTACHLOROBIPHENYL (BZ-92)	PA
EPA 1668 A	2,2',3,5,6'-PENTACHLOROBIPHENYL (BZ-94)	PA	EPA 1668 A	2,2',3,5,6,6'-HEXACHLOROBIPHENYL (BZ-152)	PA

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EPA 1668 A	2,2',3,5,6-PENTACHLOROBIPHENYL (BZ-93)	PA	EPA 1668 A	2,2',3,5-TETRACHLOROBIPHENYL (BZ-43)	PA
EPA 1668 A	2,2',3,6'-TETRACHLOROBIPHENYL (BZ-46)	PA	EPA 1668 A	2,2',3,6,6'-PENTACHLOROBIPHENYL (BZ-96)	PA
EPA 1668 A	2,2',3,6-TETRACHLOROBIPHENYL (BZ-45)	PA	EPA 1668 A	2,2',3-TRICHLOROBIPHENYL (BZ-16)	PA
EPA 1668 A	2,2',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-153)	PA	EPA 1668 A	2,2',4,4',5,6'-HEXACHLOROBIPHENYL (BZ-154)	PA
EPA 1668 A	2,2',4,4',5-PENTACHLOROBIPHENYL (BZ-99)	PA	EPA 1668 A	2,2',4,4',6,6'-HEXACHLOROBIPHENYL (BZ-155)	PA
EPA 1668 A	2,2',4,4',6-PENTACHLOROBIPHENYL (BZ-100)	PA	EPA 1668 A	2,2',4,4'-TETRACHLOROBIPHENYL (BZ-47)	PA
EPA 1668 A	2,2',4,5',6-PENTACHLOROBIPHENYL (BZ-103)	PA	EPA 1668 A	2,2',4,5'-TETRACHLOROBIPHENYL (BZ-49)	PA
EPA 1668 A	2,2',4,5,5'-PENTACHLOROBIPHENYL (BZ-101)	PA	EPA 1668 A	2,2',4,5,6'-PENTACHLOROBIPHENYL (BZ-102)	PA
EPA 1668 A	2,2',4,5-TETRACHLOROBIPHENYL (BZ-48)	PA	EPA 1668 A	2,2',4,6'-TETRACHLOROBIPHENYL (BZ-51)	PA
EPA 1668 A	2,2',4,6,6'-PENTACHLOROBIPHENYL (BZ-104)	PA	EPA 1668 A	2,2',4,6-TETRACHLOROBIPHENYL (BZ-50)	PA
EPA 1668 A	2,2',4-TRICHLOROBIPHENYL (BZ-17)	PA	EPA 1668 A	2,2',5,5'-TETRACHLOROBIPHENYL (BZ-52)	PA
EPA 1668 A	2,2',5,6'-TETRACHLOROBIPHENYL (BZ-53)	PA	EPA 1668 A	2,2',5-TRICHLOROBIPHENYL (BZ-18)	PA
EPA 1668 A	2,2',6,6'-TETRACHLOROBIPHENYL (BZ-54)	PA	EPA 1668 A	2,2',6-TRICHLOROBIPHENYL (BZ-19)	PA
EPA 1668 A	2,2'-DICHLOROBIPHENYL (BZ-4)	PA	EPA 1668 A	2,3',4',5,6-PENTACHLOROBIPHENYL (BZ-125)	PA
EPA 1668 A	2,3',4',5'-TETRACHLOROBIPHENYL (BZ-76)	PA	EPA 1668 A	2,3',4',5,5'-PENTACHLOROBIPHENYL (BZ-124)	PA
EPA 1668 A	2,3',4',5-TETRACHLOROBIPHENYL (BZ-70)	PA	EPA 1668 A	2,3',4',6-TETRACHLOROBIPHENYL (BZ-71)	PA
EPA 1668 A	2,3',4'-TRICHLOROBIPHENYL (BZ-33)	PA	EPA 1668 A	2,3',4,4',5',6-HEXACHLOROBIPHENYL (BZ-168)	PA
EPA 1668 A	2,3',4,4',5'-PENTACHLOROBIPHENYL (BZ-123)	PA	EPA 1668 A	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-167)	PA
EPA 1668 A	2,3',4,4',5-PENTACHLOROBIPHENYL (BZ-118)	PA	EPA 1668 A	2,3',4,4',6-PENTACHLOROBIPHENYL (BZ-119)	PA
EPA 1668 A	2,3',4,4'-TETRACHLOROBIPHENYL (BZ-66)	PA	EPA 1668 A	2,3',4,5',6-PENTACHLOROBIPHENYL (BZ-121)	PA
EPA 1668 A	2,3',4,5'-TETRACHLOROBIPHENYL (BZ-68)	PA	EPA 1668 A	2,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-120)	PA
EPA 1668 A	2,3',4,5-TETRACHLOROBIPHENYL (BZ-67)	PA	EPA 1668 A	2,3',4,6-TETRACHLOROBIPHENYL (BZ-69)	PA
EPA 1668 A	2,3',4-TRICHLOROBIPHENYL (BZ-25)	PA	EPA 1668 A	2,3',5',6-TETRACHLOROBIPHENYL (BZ-73)	PA
EPA 1668 A	2,3',5'-TRICHLOROBIPHENYL (BZ-34)	PA	EPA 1668 A	2,3',5,5'-TETRACHLOROBIPHENYL (BZ-72)	PA
EPA 1668 A	2,3',5-TRICHLOROBIPHENYL (BZ-26)	PA	EPA 1668 A	2,3',6-TRICHLOROBIPHENYL (BZ-27)	PA

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EPA 1668 A	2,3,3',4',5'-PENTACHLOROBIPHENYL (BZ-122)	PA	EPA 1668 A	2,3,3',4',5,5',6-HEPTACHLOROBIPHENYL (BZ-193)	PA
EPA 1668 A	2,3,3',4',5,5'-HEXACHLOROBIPHENYL (BZ-162)	PA	EPA 1668 A	2,3,3',4',5,6-HEXACHLOROBIPHENYL (BZ-163)	PA
EPA 1668 A	2,3,3',4',5-PENTACHLOROBIPHENYL (BZ-107)	PA	EPA 1668 A	2,3,3',4',6-PENTACHLOROBIPHENYL (BZ-110)	PA
EPA 1668 A	2,3,3',4'-TETRACHLOROBIPHENYL (BZ-56)	PA	EPA 1668 A	2,3,3',4,4',5',6-HEPTACHLOROBIPHENYL (BZ-191)	PA
EPA 1668 A	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (BZ-157)	PA	EPA 1668 A	2,3,3',4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-205)	PA
EPA 1668 A	2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-189)	PA	EPA 1668 A	2,3,3',4,4',5,6-HEPTACHLOROBIPHENYL (BZ-190)	PA
EPA 1668 A	2,3,3',4,4',5-HEXACHLOROBIPHENYL (BZ-156)	PA	EPA 1668 A	2,3,3',4,4',6-HEXACHLOROBIPHENYL (BZ-158)	PA
EPA 1668 A	2,3,3',4,4'-PENTACHLOROBIPHENYL (BZ-105)	PA	EPA 1668 A	2,3,3',4,5',6-HEXACHLOROBIPHENYL (BZ-161)	PA
EPA 1668 A	2,3,3',4,5'-PENTACHLOROBIPHENYL (BZ-108)	PA	EPA 1668 A	2,3,3',4,5,5',6-HEPTACHLOROBIPHENYL (BZ-192)	PA
EPA 1668 A	2,3,3',4,5,5'-HEXACHLOROBIPHENYL (BZ-159)	PA	EPA 1668 A	2,3,3',4,5,6-HEXACHLOROBIPHENYL (BZ-160)	PA
EPA 1668 A	2,3,3',4,5-PENTACHLOROBIPHENYL (BZ-106)	PA	EPA 1668 A	2,3,3',4,6-PENTACHLOROBIPHENYL (BZ-109)	PA
EPA 1668 A	2,3,3',4-TETRACHLOROBIPHENYL (BZ-55)	PA	EPA 1668 A	2,3,3',5',6-PENTACHLOROBIPHENYL (BZ-113)	PA
EPA 1668 A	2,3,3',5'-TETRACHLOROBIPHENYL (BZ-58)	PA	EPA 1668 A	2,3,3',5,5',6-HEXACHLOROBIPHENYL (BZ-165)	PA
EPA 1668 A	2,3,3',5,5'-PENTACHLOROBIPHENYL (BZ-111)	PA	EPA 1668 A	2,3,3',5,6-PENTACHLOROBIPHENYL (BZ-112)	PA
EPA 1668 A	2,3,3',5-TETRACHLOROBIPHENYL (BZ-57)	PA	EPA 1668 A	2,3,3',6-TETRACHLOROBIPHENYL (BZ-59)	PA
EPA 1668 A	2,3,3'-TRICHLOROBIPHENYL (BZ-20)	PA	EPA 1668 A	2,3,4',5,6-PENTACHLOROBIPHENYL (BZ-117)	PA
EPA 1668 A	2,3,4',5-TETRACHLOROBIPHENYL (BZ-63)	PA	EPA 1668 A	2,3,4',6-TETRACHLOROBIPHENYL (BZ-64)	PA
EPA 1668 A	2,3,4'-TRICHLOROBIPHENYL (BZ-22)	PA	EPA 1668 A	2,3,4,4',5,6-HEXACHLOROBIPHENYL (BZ-166)	PA
EPA 1668 A	2,3,4,4',5-PENTACHLOROBIPHENYL (BZ-114)	PA	EPA 1668 A	2,3,4,4',6-PENTACHLOROBIPHENYL (BZ-115)	PA
EPA 1668 A	2,3,4,4'-TETRACHLOROBIPHENYL (BZ-60)	PA	EPA 1668 A	2,3,4,5,6-PENTACHLOROBIPHENYL (BZ-116)	PA
EPA 1668 A	2,3,4,5-TETRACHLOROBIPHENYL (BZ-61)	PA	EPA 1668 A	2,3,4,6-TETRACHLOROBIPHENYL (BZ-62)	PA
EPA 1668 A	2,3,4-TRICHLOROBIPHENYL (BZ-21)	PA	EPA 1668 A	2,3,5,6-TETRACHLOROBIPHENYL (BZ-65)	PA
EPA 1668 A	2,3,5-TRICHLOROBIPHENYL (BZ-23)	PA	EPA 1668 A	2,3,6-TRICHLOROBIPHENYL (BZ-24)	PA
EPA 1668 A	2,3-DICHLOROBIPHENYL (BZ-5)	PA	EPA 1668 A	2,4',5-TRICHLOROBIPHENYL (BZ-31)	PA

Scope of Accreditation

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1668 A	2,4',6-TRICHLOROBIPHENYL (BZ-32)	PA	EPA 1668 A	2,4'-DICHLOROBIPHENYL (BZ-8)	PA
EPA 1668 A	2,4,4',5-TETRACHLOROBIPHENYL (BZ-74)	PA	EPA 1668 A	2,4,4',6-TETRACHLOROBIPHENYL (BZ-75)	PA
EPA 1668 A	2,4,4'-TRICHLOROBIPHENYL (BZ-28)	PA	EPA 1668 A	2,4,5-TRICHLOROBIPHENYL (BZ-29)	PA
EPA 1668 A	2,4,6-TRICHLOROBIPHENYL (BZ-30)	PA	EPA 1668 A	2,4-DICHLOROBIPHENYL (BZ-7)	PA
EPA 1668 A	2,5-DICHLOROBIPHENYL (BZ-9)	PA	EPA 1668 A	2,6-DICHLOROBIPHENYL (BZ-10)	PA
EPA 1668 A	2-CHLOROBIPHENYL (BZ-1)	PA	EPA 1668 A	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-169)	PA
EPA 1668 A	3,3',4,4',5-PENTACHLOROBIPHENYL (BZ-126)	PA	EPA 1668 A	3,3',4,4'-TETRACHLOROBIPHENYL (BZ-77)	PA
EPA 1668 A	3,3',4,5'-TETRACHLOROBIPHENYL (BZ-79)	PA	EPA 1668 A	3,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-127)	PA
EPA 1668 A	3,3',4,5-TETRACHLOROBIPHENYL (BZ-78)	PA	EPA 1668 A	3,3',4-TRICHLOROBIPHENYL (BZ-35)	PA
EPA 1668 A	3,3',5,5'-TETRACHLOROBIPHENYL (BZ-80)	PA	EPA 1668 A	3,3',5-TRICHLOROBIPHENYL (BZ-36)	PA
EPA 1668 A	3,3'-DICHLOROBIPHENYL (BZ-11)	PA	EPA 1668 A	3,4',5-TRICHLOROBIPHENYL (BZ-39)	PA
EPA 1668 A	3,4'-DICHLOROBIPHENYL (BZ-13)	PA	EPA 1668 A	3,4,4',5-TETRACHLOROBIPHENYL (BZ-81)	PA
EPA 1668 A	3,4,4'-TRICHLOROBIPHENYL (BZ-37)	PA	EPA 1668 A	3,4,5-TRICHLOROBIPHENYL (BZ-38)	PA
EPA 1668 A	3,4-DICHLOROBIPHENYL (BZ-12)	PA	EPA 1668 A	3,5-DICHLOROBIPHENYL (BZ-14)	PA
EPA 1668 A	3-CHLOROBIPHENYL (BZ-2)	PA	EPA 1668 A	4,4'-DICHLOROBIPHENYL (BZ-15)	PA
EPA 1668 A	4-CHLOROBIPHENYL (BZ-3)	PA	EPA 1668 A	DECACHLOROBIPHENYL (BZ-209)	PA
EPA 1671 A	ACETONITRILE	PA	EPA 1671 A	DIETHYLAMINE	PA
EPA 1671 A	DIMETHYL SULFOXIDE	PA	EPA 1671 A	ETHANOL	PA
EPA 1671 A	METHANOL	PA	EPA 1671 A	METHYL CELLOSOLVE	PA
EPA 1671 A	N-PROPANOL (1-PROPANOL)	PA	EPA 1671 A	TRIETHYLAMINE	PA
EPA 180.1 REV 2	TURBIDITY	PA	EPA 200.2 REV 2.8	PREP: SAMPLE PREPARATION PROCEDURE FOR SPECTROCHEMICAL DETERMINATION OF TOTAL RECOVERABLE ELEMENTS	PA
EPA 200.7 REV 4.4	ALUMINUM	PA	EPA 200.7 REV 4.4	ANTIMONY	PA
EPA 200.7 REV 4.4	ARSENIC	PA	EPA 200.7 REV 4.4	BARIUM	PA
EPA 200.7 REV 4.4	BERYLLIUM	PA	EPA 200.7 REV 4.4	BORON	PA
EPA 200.7 REV 4.4	CADMIUM	PA	EPA 200.7 REV 4.4	CALCIUM	PA
EPA 200.7 REV 4.4	CHROMIUM	PA	EPA 200.7 REV 4.4	COBALT	PA
EPA 200.7 REV 4.4	COPPER	PA	EPA 200.7 REV 4.4	IRON	PA
EPA 200.7 REV 4.4	LEAD	PA	EPA 200.7 REV 4.4	MAGNESIUM	PA
EPA 200.7 REV 4.4	MANGANESE	PA	EPA 200.7 REV 4.4	MOLYBDENUM	PA
EPA 200.7 REV 4.4	NICKEL	PA	EPA 200.7 REV 4.4	POTASSIUM	PA

Commonwealth of Virginia

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 200.7 REV 4.4	SELENIUM	PA	EPA 200.7 REV 4.4	SILVER	PA
EPA 200.7 REV 4.4	SODIUM	PA	EPA 200.7 REV 4.4	THALLIUM	PA
EPA 200.7 REV 4.4	TIN	PA	EPA 200.7 REV 4.4	TITANIUM	PA
EPA 200.7 REV 4.4	VANADIUM	PA	EPA 200.7 REV 4.4	ZINC	PA
EPA 200.8 REV 5.4	ALUMINUM	PA	EPA 200.8 REV 5.4	ANTIMONY	PA
EPA 200.8 REV 5.4	ARSENIC	PA	EPA 200.8 REV 5.4	BARIUM	PA
EPA 200.8 REV 5.4	BERYLLIUM	PA	EPA 200.8 REV 5.4	CADMIUM	PA
EPA 200.8 REV 5.4	CHROMIUM	PA	EPA 200.8 REV 5.4	COBALT	PA
EPA 200.8 REV 5.4	COPPER	PA	EPA 200.8 REV 5.4	LEAD	PA
EPA 200.8 REV 5.4	MANGANESE	PA	EPA 200.8 REV 5.4	MOLYBDENUM	PA
EPA 200.8 REV 5.4	NICKEL	PA	EPA 200.8 REV 5.4	SELENIUM	PA
EPA 200.8 REV 5.4	SILVER	PA	EPA 200.8 REV 5.4	THALLIUM	PA
EPA 200.8 REV 5.4	VANADIUM	PA	EPA 200.8 REV 5.4	ZINC	PA
EPA 200.8 REV 5.4 - EXTENDED	BORON	PA	EPA 200.8 REV 5.4 - EXTENDED	CALCIUM	PA
EPA 200.8 REV 5.4 - EXTENDED	IRON	PA	EPA 200.8 REV 5.4 - EXTENDED	MAGNESIUM	PA
EPA 200.8 REV 5.4 - EXTENDED	POTASSIUM	PA	EPA 200.8 REV 5.4 - EXTENDED	SODIUM	PA
EPA 200.8 REV 5.4 - EXTENDED	TIN	PA	EPA 200.8 REV 5.4 - EXTENDED	TITANIUM	PA
EPA 245.1 REV 3	MERCURY	PA	EPA 300.0 REV 2.1	BROMIDE	PA
EPA 300.0 REV 2.1	CHLORIDE	PA	EPA 300.0 REV 2.1	FLUORIDE	PA
EPA 300.0 REV 2.1	NITRATE AS N	PA	EPA 300.0 REV 2.1	NITRITE AS N	PA
EPA 300.0 REV 2.1	ORTHOPHOSPHATE AS P	PA	EPA 300.0 REV 2.1	SULFATE	PA
EPA 3005 A	PREP: ACID DIGESTION OF WATERS FOR TOTAL RECOVERABLE OR DISSOLVED METALS	PA	EPA 3010 A	PREP: ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	PA
EPA 3020 A	PREP: ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	PA	EPA 335.4 REV 1.0	CYANIDE	PA
EPA 351.2 REV 2	KJELDAHL NITROGEN - TOTAL	PA	EPA 3510 C	PREP: LIQUID-LIQUID EXTRACTION	PA
EPA 3511	PREP: ORGANIC EXTRACTION AND SAMPLE PREPARATION	PA	EPA 3520 C	PREP: CONTINUOUS LIQUID-LIQUID EXTRACTION	PA
EPA 353.2 REV 2	NITRATE AS N	PA	EPA 353.2 REV 2	NITRATE/NITRITE	PA
EPA 353.2 REV 2	NITRITE AS N	PA	EPA 3620 C	PREP: FLORISIL CLEANUP	PA
EPA 3630 C	PREP: SILICA GEL CLEANUP	PA	EPA 365.1 REV 2	PHOSPHORUS, TOTAL	PA
EPA 365.3	ORTHOPHOSPHATE AS P	PA	EPA 410.4 REV 2	CHEMICAL OXYGEN DEMAND	PA
EPA 420.4 REV 1	TOTAL PHENOLICS	PA	EPA 5030	PREP: PURGE AND TRAP FOR AQUEOUS SAMPLES	PA
EPA 6010 B	ALUMINUM	PA	EPA 6010 B	ANTIMONY	PA
EPA 6010 B	ARSENIC	PA	EPA 6010 B	BARIUM	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 6010 B	BERYLLIUM	PA	EPA 6010 B	BORON	PA
EPA 6010 B	CADMIUM	PA	EPA 6010 B	CALCIUM	PA
EPA 6010 B	CHROMIUM	PA	EPA 6010 B	COBALT	PA
EPA 6010 B	COPPER	PA	EPA 6010 B	IRON	PA
EPA 6010 B	LEAD	PA	EPA 6010 B	LITHIUM	PA
EPA 6010 B	MAGNESIUM	PA	EPA 6010 B	MANGANESE	PA
EPA 6010 B	MOLYBDENUM	PA	EPA 6010 B	NICKEL	PA
EPA 6010 B	POTASSIUM	PA	EPA 6010 B	SELENIUM	PA
EPA 6010 B	SILVER	PA	EPA 6010 B	SODIUM	PA
EPA 6010 B	STRONTIUM	PA	EPA 6010 B	THALLIUM	PA
EPA 6010 B	TIN	PA	EPA 6010 B	TITANIUM	PA
EPA 6010 B	VANADIUM	PA	EPA 6010 B	ZINC	PA
EPA 6010 C	ALUMINUM	PA	EPA 6010 C	ANTIMONY	PA
EPA 6010 C	ARSENIC	PA	EPA 6010 C	BARIUM	PA
EPA 6010 C	BERYLLIUM	PA	EPA 6010 C	BORON	PA
EPA 6010 C	CADMIUM	PA	EPA 6010 C	CALCIUM	PA
EPA 6010 C	CHROMIUM	PA	EPA 6010 C	COBALT	PA
EPA 6010 C	COPPER	PA	EPA 6010 C	IRON	PA
EPA 6010 C	LEAD	PA	EPA 6010 C	LITHIUM	PA
EPA 6010 C	MAGNESIUM	PA	EPA 6010 C	MANGANESE	PA
EPA 6010 C	MOLYBDENUM	PA	EPA 6010 C	NICKEL	PA
EPA 6010 C	POTASSIUM	PA	EPA 6010 C	SELENIUM	PA
EPA 6010 C	SILVER	PA	EPA 6010 C	SODIUM	PA
EPA 6010 C	STRONTIUM	PA	EPA 6010 C	THALLIUM	PA
EPA 6010 C	TIN	PA	EPA 6010 C	TITANIUM	PA
EPA 6010 C	VANADIUM	PA	EPA 6010 C	ZINC	PA
EPA 602	BENZENE	PA	EPA 602	ETHYLBENZENE	PA
EPA 602	TOLUENE	PA	EPA 602	XYLENE (TOTAL)	PA
EPA 6020 A	ALUMINUM	PA	EPA 6020 A	ANTIMONY	PA
EPA 6020 A	ARSENIC	PA	EPA 6020 A	BARIUM	PA
EPA 6020 A	BERYLLIUM	PA	EPA 6020 A	CADMIUM	PA
EPA 6020 A	CALCIUM	PA	EPA 6020 A	CHROMIUM	PA
EPA 6020 A	COBALT	PA	EPA 6020 A	COPPER	PA
EPA 6020 A	IRON	PA	EPA 6020 A	LEAD	PA
EPA 6020 A	MAGNESIUM	PA	EPA 6020 A	MANGANESE	PA
EPA 6020 A	NICKEL	PA	EPA 6020 A	POTASSIUM	PA
EPA 6020 A	SELENIUM	PA	EPA 6020 A	SILVER	PA
EPA 6020 A	SODIUM	PA	EPA 6020 A	THALLIUM	PA
EPA 6020 A	VANADIUM	PA	EPA 6020 A	ZINC	PA

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EPA 6020 A - EXTENDED	BORON	PA	EPA 6020 A - EXTENDED	MOLYBDENUM	PA
EPA 6020 A - EXTENDED	STRONTIUM	PA	EPA 6020 A - EXTENDED	TIN	PA
EPA 6020 A - EXTENDED	TITANIUM	PA	EPA 608	4,4'-DDD	PA
EPA 608	4,4'-DDE	PA	EPA 608	4,4'-DDT	PA
EPA 608	ALDRIN	PA	EPA 608	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 608	AROCLOR-1016 (PCB-1016)	PA	EPA 608	AROCLOR-1221 (PCB-1221)	PA
EPA 608	AROCLOR-1232 (PCB-1232)	PA	EPA 608	AROCLOR-1242 (PCB-1242)	PA
EPA 608	AROCLOR-1248 (PCB-1248)	PA	EPA 608	AROCLOR-1254 (PCB-1254)	PA
EPA 608	AROCLOR-1260 (PCB-1260)	PA	EPA 608	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 608	CHLORDANE (TECH.)	PA	EPA 608	DELTA-BHC	PA
EPA 608	DIELDRIN	PA	EPA 608	ENDOSULFAN I	PA
EPA 608	ENDOSULFAN II	PA	EPA 608	ENDOSULFAN SULFATE	PA
EPA 608	ENDRIN	PA	EPA 608	ENDRIN ALDEHYDE	PA
EPA 608	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 608	HEPTACHLOR	PA
EPA 608	HEPTACHLOR EPOXIDE	PA	EPA 608	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 610 (HPLC)	ACENAPHTHENE	PA	EPA 610 (HPLC)	ACENAPHTHYLENE	PA
EPA 610 (HPLC)	ANTHRACENE	PA	EPA 610 (HPLC)	BENZO(A)ANTHRACENE	PA
EPA 610 (HPLC)	BENZO(A)PYRENE	PA	EPA 610 (HPLC)	BENZO(G,H,I)PERYLENE	PA
EPA 610 (HPLC)	BENZO(K)FLUORANTHENE	PA	EPA 610 (HPLC)	BENZO[B]FLUORANTHENE	PA
EPA 610 (HPLC)	CHRYSENE	PA	EPA 610 (HPLC)	DIBENZO(A,H) ANTHRACENE	PA
EPA 610 (HPLC)	FLUORANTHENE	PA	EPA 610 (HPLC)	FLUORENE	PA
EPA 610 (HPLC)	INDENO(1,2,3-CD) PYRENE	PA	EPA 610 (HPLC)	NAPHTHALENE	PA
EPA 610 (HPLC)	PHENANTHRENE	PA	EPA 610 (HPLC)	PYRENE	PA
EPA 622	AZINPHOS-METHYL (GUTHION)	PA	EPA 622	BOLSTAR (SULPROFOS)	PA
EPA 622	CHLORPYRIFOS	PA	EPA 622	DEMETON-O	PA
EPA 622	DEMETON-S	PA	EPA 622	DIAZINON	PA
EPA 622	DICHLOROVOS (DDVP, DICHLORVOS)	PA	EPA 622	DISULFOTON	PA
EPA 622	ETHOPROP	PA	EPA 622	FENSULFOTHION	PA
EPA 622	FENTHION	PA	EPA 622	MERPHOS	PA
EPA 622	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 622	MEVINPHOS	PA
EPA 622	NALED	PA	EPA 622	PHORATE	PA
EPA 622	STIROFOS	PA	EPA 624	1,1,1-TRICHLOROETHANE	PA

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EPA 624	1,1,2,2-TETRACHLOROETHANE	PA	EPA 624	1,1,2-TRICHLOROETHANE	PA
EPA 624	1,1-DICHLOROETHANE	PA	EPA 624	1,2-DICHLOROBENZENE	PA
EPA 624	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA	EPA 624	1,2-DICHLOROPROPANE	PA
EPA 624	1,3-DICHLOROBENZENE	PA	EPA 624	1,4-DICHLOROBENZENE	PA
EPA 624	2-CHLOROETHYL VINYL ETHER	PA	EPA 624	ACROLEIN (PROPENAL)	PA
EPA 624	ACRYLONITRILE	PA	EPA 624	BENZENE	PA
EPA 624	BROMODICHLOROMETHANE	PA	EPA 624	BROMOFORM	PA
EPA 624	CARBON TETRACHLORIDE	PA	EPA 624	CHLOROBENZENE	PA
EPA 624	CHLORODIBROMOMETHANE	PA	EPA 624	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 624	CHLOROFORM	PA	EPA 624	CIS-1,3-DICHLOROPROPENE	PA
EPA 624	ETHYLBENZENE	PA	EPA 624	METHYL BROMIDE (BROMOMETHANE)	PA
EPA 624	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 624	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 624	TETRACHLOROETHENE (PERCHLOROETHENE)	PA	EPA 624	TOLUENE	PA
EPA 624	TRANS-1,2-DICHLOROETHENE	PA	EPA 624	TRANS-1,3-DICHLOROPROPENE	PA
EPA 624	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 624	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 624	VINYL CHLORIDE	PA	EPA 624 - EXTENDED	1,1-DICHLOROETHYLENE	PA
EPA 625	1,2,4-TRICHLOROBENZENE	PA	EPA 625	2,4,6-TRICHLOROPHENOL	PA
EPA 625	2,4-DICHLOROPHENOL	PA	EPA 625	2,4-DIMETHYLPHENOL	PA
EPA 625	2,4-DINITROPHENOL	PA	EPA 625	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 625	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 625	2-CHLORONAPHTHALENE	PA
EPA 625	2-CHLOROPHENOL	PA	EPA 625	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 625	2-METHYLPHENOL (O-CRESOL)	PA	EPA 625	2-NITROPHENOL	PA
EPA 625	3,3'-DICHLOROBENZIDINE	PA	EPA 625	4-BROMOPHENYL PHENYL ETHER	PA
EPA 625	4-CHLORO-3-METHYLPHENOL	PA	EPA 625	4-CHLOROPHENYL PHENYLETHER	PA
EPA 625	4-NITROPHENOL	PA	EPA 625	ACENAPHTHENE	PA
EPA 625	ACENAPHTHYLENE	PA	EPA 625	ANTHRACENE	PA
EPA 625	BENZIDINE	PA	EPA 625	BENZO(A)ANTHRACENE	PA
EPA 625	BENZO(A)PYRENE	PA	EPA 625	BENZO(G,H,I)PERYLENE	PA
EPA 625	BENZO(K)FLUORANTHENE	PA	EPA 625	BENZO[B]FLUORANTHENE	PA
EPA 625	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 625	BIS(2-CHLOROETHYL) ETHER	PA
EPA 625	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 625	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 625	BUTYL BENZYL PHTHALATE	PA	EPA 625	CHRYSENE	PA

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EPA 625	DI-N-BUTYL PHTHALATE	PA	EPA 625	DI-N-OCTYL PHTHALATE	PA
EPA 625	DIBENZO(A,H) ANTHRACENE	PA	EPA 625	DIETHYL PHTHALATE	PA
EPA 625	DIMETHYL PHTHALATE	PA	EPA 625	FLUORANTHENE	PA
EPA 625	FLUORENE	PA	EPA 625	HEXACHLOROBENZENE	PA
EPA 625	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 625	HEXACHLOROCYCLOPENTADIENE	PA
EPA 625	HEXACHLOROETHANE	PA	EPA 625	INDENO(1,2,3-CD) PYRENE	PA
EPA 625	ISOPHORONE	PA	EPA 625	N-NITROSODI-N-PROPYLAMINE	PA
EPA 625	N-NITROSODIMETHYLAMINE	PA	EPA 625	N-NITROSODIPHENYLAMINE	PA
EPA 625	NAPHTHALENE	PA	EPA 625	NITROBENZENE	PA
EPA 625	PENTACHLOROPHENOL	PA	EPA 625	PHENANTHRENE	PA
EPA 625	PHENOL	PA	EPA 625	PYRENE	PA
EPA 625 - EXTENDED	1,2-DIPHENYLHYDRAZINE	PA	EPA 625 - EXTENDED	4-METHYLPHENOL (P-CRESOL)	PA
EPA 625 - EXTENDED	ACETOPHENONE	PA	EPA 625 - EXTENDED	ANILINE	PA
EPA 625 - EXTENDED	CARBAZOLE	PA	EPA 625 - EXTENDED	N-DECANE	PA
EPA 625 - EXTENDED	N-OCTADECANE	PA	EPA 625 - EXTENDED	PYRIDINE	PA
EPA 6850	PERCHLORATE	PA	EPA 7196 A	CHROMIUM VI	PA
EPA 7470 A	MERCURY	PA	EPA 8011	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 8011	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 8015 B	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 B	ETHANOL	PA	EPA 8015 B	ETHYLENE GLYCOL	PA
EPA 8015 B	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 B	METHANOL	PA	EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 C	ETHANOL	PA	EPA 8015 C	ETHYLENE GLYCOL	PA
EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 C	METHANOL	PA	EPA 8015 D - EXTENDED	FORMIC ACID	PA
EPA 8021 B	BENZENE	PA	EPA 8021 B	ETHYLBENZENE	PA
EPA 8021 B	ISOPROPYLBENZENE	PA	EPA 8021 B	M+P-XYLENE	PA
EPA 8021 B	NAPHTHALENE	PA	EPA 8021 B	O-XYLENE	PA
EPA 8021 B	TOLUENE	PA	EPA 8021 B	XYLENE (TOTAL)	PA
EPA 8021 B - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8081 A	4,4'-DDD	PA
EPA 8081 A	4,4'-DDE	PA	EPA 8081 A	4,4'-DDT	PA
EPA 8081 A	ALDRIN	PA	EPA 8081 A	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA	EPA 8081 A	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	CHLORDANE (TECH.)	PA	EPA 8081 A	DELTA-BHC	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8081 A	DIELDRIN	PA	EPA 8081 A	ENDOSULFAN I	PA
EPA 8081 A	ENDOSULFAN II	PA	EPA 8081 A	ENDOSULFAN SULFATE	PA
EPA 8081 A	ENDRIN	PA	EPA 8081 A	ENDRIN ALDEHYDE	PA
EPA 8081 A	ENDRIN KETONE	PA	EPA 8081 A	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA	EPA 8081 A	HEPTACHLOR	PA
EPA 8081 A	HEPTACHLOR EPOXIDE	PA	EPA 8081 A	METHOXYCHLOR	PA
EPA 8081 A	TOXAPHENE (CHLORINATED CAMPHENE)	PA	EPA 8081 B	4,4'-DDD	PA
EPA 8081 B	4,4'-DDE	PA	EPA 8081 B	4,4'-DDT	PA
EPA 8081 B	ALDRIN	PA	EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA	EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	CHLORDANE (TECH.)	PA	EPA 8081 B	DELTA-BHC	PA
EPA 8081 B	DIELDRIN	PA	EPA 8081 B	ENDOSULFAN I	PA
EPA 8081 B	ENDOSULFAN II	PA	EPA 8081 B	ENDOSULFAN SULFATE	PA
EPA 8081 B	ENDRIN	PA	EPA 8081 B	ENDRIN ALDEHYDE	PA
EPA 8081 B	ENDRIN KETONE	PA	EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA	EPA 8081 B	HEPTACHLOR	PA
EPA 8081 B	HEPTACHLOR EPOXIDE	PA	EPA 8081 B	METHOXYCHLOR	PA
EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	PA	EPA 8082 A	AROCLOR-1016 (PCB-1016)	PA
EPA 8082 A	AROCLOR-1221 (PCB-1221)	PA	EPA 8082 A	AROCLOR-1232 (PCB-1232)	PA
EPA 8082 A	AROCLOR-1242 (PCB-1242)	PA	EPA 8082 A	AROCLOR-1248 (PCB-1248)	PA
EPA 8082 A	AROCLOR-1254 (PCB-1254)	PA	EPA 8082 A	AROCLOR-1260 (PCB-1260)	PA
EPA 8082 A - EXTENDED	AROCLOR-1262 (PCB-1262)	PA	EPA 8082 A - EXTENDED	AROCLOR-1268 (PCB-1268)	PA
EPA 8141 A	ATRAZINE	PA	EPA 8141 A	BOLSTAR (SULPROFOS)	PA
EPA 8141 A	CHLORPYRIFOS	PA	EPA 8141 A	COUMAPHOS	PA
EPA 8141 A	DEMETON-O	PA	EPA 8141 A	DEMETON-S	PA
EPA 8141 A	DIAZINON	PA	EPA 8141 A	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 A	DISULFOTON	PA	EPA 8141 A	ETHION	PA
EPA 8141 A	ETHOPROP	PA	EPA 8141 A	FAMPHUR	PA
EPA 8141 A	FENSULFOTHION	PA	EPA 8141 A	FENTHION	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8141 A	MALATHION	PA	EPA 8141 A	MERPHOS	PA
EPA 8141 A	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8141 A	MEVINPHOS	PA
EPA 8141 A	NALED	PA	EPA 8141 A	PARATHION (PARATHION - ETHYL)	PA
EPA 8141 A	PHORATE	PA	EPA 8141 A	RONNEL	PA
EPA 8141 A	SIMAZINE	PA	EPA 8141 A	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA
EPA 8141 A	TOKUTHION (PROTHIOPHOS)	PA	EPA 8141 A	TRICHLORONATE	PA
EPA 8141 B	ATRAZINE	PA	EPA 8141 B	AZINPHOS-METHYL (GUTHION)	PA
EPA 8141 B	BOLSTAR (SULPROFOS)	PA	EPA 8141 B	CHLORPYRIFOS	PA
EPA 8141 B	COUMAPHOS	PA	EPA 8141 B	DEMETON-O	PA
EPA 8141 B	DEMETON-S	PA	EPA 8141 B	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 B	DISULFOTON	PA	EPA 8141 B	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA
EPA 8141 B	ETHION	PA	EPA 8141 B	ETHOPROP	PA
EPA 8141 B	FAMPHUR	PA	EPA 8141 B	FENSULFOTHION	PA
EPA 8141 B	FENTHION	PA	EPA 8141 B	MALATHION	PA
EPA 8141 B	MERPHOS	PA	EPA 8141 B	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8141 B	MEVINPHOS	PA	EPA 8141 B	NALED	PA
EPA 8141 B	PARATHION (PARATHION - ETHYL)	PA	EPA 8141 B	PHORATE	PA
EPA 8141 B	RONNEL	PA	EPA 8141 B	SIMAZINE	PA
EPA 8141 B	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA	EPA 8141 B	TOKUTHION (PROTHIOPHOS)	PA
EPA 8141 B	TRICHLORONATE	PA	EPA 8151 A	2,4,5-T	PA
EPA 8151 A	2,4-D	PA	EPA 8151 A	2,4-DB	PA
EPA 8151 A	DALAPON	PA	EPA 8151 A	DICAMBA	PA
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	PA	EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA
EPA 8151 A	MCPA	PA	EPA 8151 A	MCPP	PA
EPA 8151 A	PENTACHLOROPHENOL	PA	EPA 8151 A	PICLORAM	PA
EPA 8151 A	SILVEX (2,4,5-TP)	PA	EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	PA
EPA 8260 B	1,1,1-TRICHLOROETHANE	PA	EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 B	1,1,2-TRICHLOROETHANE	PA	EPA 8260 B	1,1-DICHLOROETHANE	PA
EPA 8260 B	1,1-DICHLOROETHYLENE	PA	EPA 8260 B	1,1-DICHLOROPROPENE	PA
EPA 8260 B	1,2,3-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 B	1,2,4-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,4-TRIMETHYLBENZENE	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA	EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 B	1,2-DICHLOROBENZENE	PA	EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 B	1,2-DICHLOROPROPANE	PA	EPA 8260 B	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 B	1,3-DICHLOROBENZENE	PA	EPA 8260 B	1,3-DICHLOROPROPANE	PA
EPA 8260 B	1,4-DICHLOROBENZENE	PA	EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 B	1-BUTANOL (N-BUTANOL)	PA	EPA 8260 B	2,2-DICHLOROPROPANE	PA
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 B	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 B	2-CHLOROTOLUENE	PA	EPA 8260 B	2-HEXANONE	PA
EPA 8260 B	2-NITROPROPANE	PA	EPA 8260 B	4-CHLOROTOLUENE	PA
EPA 8260 B	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 B	ACETONE	PA	EPA 8260 B	ACETONITRILE	PA
EPA 8260 B	ACROLEIN (PROPENAL)	PA	EPA 8260 B	ACRYLONITRILE	PA
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 B	BENZENE	PA
EPA 8260 B	BENZYL CHLORIDE	PA	EPA 8260 B	BROMOBENZENE	PA
EPA 8260 B	BROMOCHLOROMETHANE	PA	EPA 8260 B	BROMODICHLOROMETHANE	PA
EPA 8260 B	BROMOFORM	PA	EPA 8260 B	CARBON DISULFIDE	PA
EPA 8260 B	CARBON TETRACHLORIDE	PA	EPA 8260 B	CHLOROBENZENE	PA
EPA 8260 B	CHLORODIBROMOMETHANE	PA	EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 B	CHLOROFORM	PA	EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 B	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	PA	EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	PA
EPA 8260 B	DIETHYL ETHER	PA	EPA 8260 B	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA
EPA 8260 B	ETHANOL	PA	EPA 8260 B	ETHYL ACETATE	PA
EPA 8260 B	ETHYL METHACRYLATE	PA	EPA 8260 B	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B	ETHYLBENZENE	PA	EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8260 B	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 B	ISOPROPYLBENZENE	PA
EPA 8260 B	M+P-XYLENE	PA	EPA 8260 B	METHACRYLONITRILE	PA
EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	PA	EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	PA
EPA 8260 B	METHYL METHACRYLATE	PA	EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	PA

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2425 NEW HOLLAND PIKE
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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
			EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 8260 B	N-BUTYLBENZENE	PA	EPA 8260 B	N-PROPYLAMINE	PA
EPA 8260 B	N-PROPYLBENZENE	PA	EPA 8260 B	NAPHTHALENE	PA
EPA 8260 B	O-XYLENE	PA	EPA 8260 B	PENTACHLOROETHANE	PA
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	PA	EPA 8260 B	SEC-BUTYLBENZENE	PA
EPA 8260 B	STYRENE	PA	EPA 8260 B	TERT-BUTYL ALCOHOL	PA
EPA 8260 B	TERT-BUTYLBENZENE	PA	EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 8260 B	TOLUENE	PA	EPA 8260 B	TRANS-1,2-DICHLOROETHENE	PA
EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	PA	EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	PA
EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 8260 B	VINYL ACETATE	PA	EPA 8260 B	VINYL CHLORIDE	PA
EPA 8260 B	XYLENE (TOTAL)	PA	EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	PA
EPA 8260 B - EXTENDED	1,3,5-TRICHLOROBENZENE	PA	EPA 8260 B - EXTENDED	CYCLOHEXANE	PA
EPA 8260 B - EXTENDED	DI-ISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA	EPA 8260 B - EXTENDED	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8260 B - EXTENDED	METHYL ACETATE	PA
EPA 8260 B - EXTENDED	METHYLCYCLOHEXANE	PA	EPA 8260 B - EXTENDED	N-HEXANE	PA
EPA 8260 B - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 B - EXTENDED	T-AMYLMETHYLETHER (TAME)	PA
EPA 8260 B - EXTENDED	TETRAHYDROFURAN (THF)	PA	EPA 8260 C	1,1,1,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1,1-TRICHLOROETHANE	PA	EPA 8260 C	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1,2-TRICHLOROETHANE	PA	EPA 8260 C	1,1-DICHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROETHYLENE	PA	EPA 8260 C	1,1-DICHLOROPROPENE	PA
EPA 8260 C	1,2,3-TRICHLOROBENZENE	PA	EPA 8260 C	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 C	1,2,4-TRICHLOROBENZENE	PA	EPA 8260 C	1,2,4-TRIMETHYLBENZENE	PA
EPA 8260 C	1,2-DIBROMO-3-CHLOROPROPAN E (DBCP)	PA	EPA 8260 C	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 C	1,2-DICHLOROBENZENE	PA	EPA 8260 C	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 C	1,2-DICHLOROPROPANE	PA	EPA 8260 C	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 C	1,3-DICHLOROBENZENE	PA	EPA 8260 C	1,3-DICHLOROPROPANE	PA
EPA 8260 C	1,4-DICHLOROBENZENE	PA	EPA 8260 C	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 C	1-BUTANOL (N-BUTANOL)	PA	EPA 8260 C	2,2-DICHLOROPROPANE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 C	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 C	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 C	2-CHLOROTOLUENE	PA	EPA 8260 C	2-HEXANONE	PA
EPA 8260 C	2-NITROPROPANE	PA	EPA 8260 C	4-CHLOROTOLUENE	PA
EPA 8260 C	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 C	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 C	ACETONE	PA	EPA 8260 C	ACETONITRILE	PA
EPA 8260 C	ACROLEIN (PROPENAL)	PA	EPA 8260 C	ACRYLONITRILE	PA
EPA 8260 C	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 C	BENZENE	PA
EPA 8260 C	BENZYL CHLORIDE	PA	EPA 8260 C	BROMOBENZENE	PA
EPA 8260 C	BROMOCHLOROMETHANE	PA	EPA 8260 C	BROMODICHLOROMETHANE	PA
EPA 8260 C	BROMOFORM	PA	EPA 8260 C	CARBON DISULFIDE	PA
EPA 8260 C	CARBON TETRACHLORIDE	PA	EPA 8260 C	CHLOROBENZENE	PA
EPA 8260 C	CHLORODIBROMOMETHANE	PA	EPA 8260 C	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 C	CHLOROFORM	PA	EPA 8260 C	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 C	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 C	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 C	CYCLOHEXANE	PA	EPA 8260 C	DIBROMOMETHANE (METHYLENE BROMIDE)	PA
EPA 8260 C	DICHLORODIFLUOROMETHANE (FREON-12)	PA	EPA 8260 C	DIETHYL ETHER	PA
EPA 8260 C	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA	EPA 8260 C	ETHANOL	PA
EPA 8260 C	ETHYL ACETATE	PA	EPA 8260 C	ETHYL METHACRYLATE	PA
EPA 8260 C	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA	EPA 8260 C	ETHYLBENZENE	PA
EPA 8260 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8260 C	HEXACHLOROETHANE	PA
EPA 8260 C	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 C	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 C	ISOPROPYLBENZENE	PA
EPA 8260 C	METHACRYLONITRILE	PA	EPA 8260 C	METHYL BROMIDE (BROMOMETHANE)	PA
EPA 8260 C	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 8260 C	METHYL METHACRYLATE	PA
EPA 8260 C	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8260 C	METHYLCYCLOHEXANE	PA
EPA 8260 C	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 C	N-BUTYLBENZENE	PA
EPA 8260 C	N-PROPYLBENZENE	PA	EPA 8260 C	NAPHTHALENE	PA
EPA 8260 C	PENTACHLOROETHANE	PA	EPA 8260 C	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 C	SEC-BUTYLBENZENE	PA	EPA 8260 C	STYRENE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 C	T-AMYLMETHYLETHER (TAME)	PA	EPA 8260 C	TERT-BUTYL ALCOHOL	PA
EPA 8260 C	TERT-BUTYLBENZENE	PA	EPA 8260 C	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 8260 C	TOLUENE	PA	EPA 8260 C	TRANS-1,2-DICHLOROETHENE	PA
EPA 8260 C	TRANS-1,3-DICHLOROPROPENE	PA	EPA 8260 C	TRANS-1,4-DICHLORO-2-BUTENE	PA
EPA 8260 C	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 8260 C	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 8260 C	VINYL ACETATE	PA	EPA 8260 C	VINYL CHLORIDE	PA
EPA 8260 C	XYLENE (TOTAL)	PA	EPA 8260 C - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	PA
EPA 8260 C - EXTENDED	CYCLOHEXANONE	PA	EPA 8260 C - EXTENDED	DI-ISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 8260 C - EXTENDED	DIMETHYL ETHER	PA	EPA 8260 C - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA
EPA 8260 C - EXTENDED	METHYL ACETATE	PA	EPA 8260 C - EXTENDED	N-HEPTANE	PA
EPA 8260 C - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 C - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8270 C	1,2,4,5-TETRACHLOROBENZENE	PA	EPA 8270 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8270 C	1,2-DICHLOROBENZENE	PA	EPA 8270 C	1,2-DIPHENYLHYDRAZINE	PA
EPA 8270 C	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8270 C	1,3-DICHLOROBENZENE	PA
EPA 8270 C	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8270 C	1,4-DICHLOROBENZENE	PA
EPA 8270 C	1,4-DINITROBENZENE	PA	EPA 8270 C	1,4-NAPHTHOQUINONE	PA
EPA 8270 C	1,4-PHENYLENEDIAMINE	PA	EPA 8270 C	1-CHLORONAPHTHALENE	PA
EPA 8270 C	1-NAPHTHYLAMINE	PA	EPA 8270 C	2,3,4,6-TETRACHLOROPHENOL	PA
EPA 8270 C	2,4,5-TRICHLOROPHENOL	PA	EPA 8270 C	2,4,6-TRICHLOROPHENOL	PA
EPA 8270 C	2,4-DICHLOROPHENOL	PA	EPA 8270 C	2,4-DIMETHYLPHENOL	PA
EPA 8270 C	2,4-DINITROPHENOL	PA	EPA 8270 C	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8270 C	2,6-DICHLOROPHENOL	PA	EPA 8270 C	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8270 C	2-ACETYLAMINOFLUORENE	PA	EPA 8270 C	2-CHLORONAPHTHALENE	PA
EPA 8270 C	2-CHLOROPHENOL	PA	EPA 8270 C	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 8270 C	2-METHYLNAPHTHALENE	PA	EPA 8270 C	2-METHYLPHENOL (O-CRESOL)	PA
EPA 8270 C	2-NAPHTHYLAMINE	PA	EPA 8270 C	2-NITROANILINE	PA
EPA 8270 C	2-NITROPHENOL	PA	EPA 8270 C	2-PICOLINE (2-METHYLPYRIDINE)	PA
EPA 8270 C	3,3'-DICHLOROBENZIDINE	PA	EPA 8270 C	3,3'-DIMETHYLBENZIDINE	PA
EPA 8270 C	3-METHYLCHOLANTHRENE	PA	EPA 8270 C	3-METHYLPHENOL (M-CRESOL)	PA
EPA 8270 C	3-NITROANILINE	PA	EPA 8270 C	4,4'-METHYLENEBIS(2-CHLOROAN ILINE)	PA
EPA 8270 C	4-AMINOBIPHENYL	PA	EPA 8270 C	4-BROMOPHENYL PHENYL ETHER	PA
EPA 8270 C	4-CHLORO-3-METHYLPHENOL	PA	EPA 8270 C	4-CHLOROANILINE	PA

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

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Expiration Date: June 14, 2015

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	4-CHLOROPHENYL PHENYLETHER	PA	EPA 8270 C	4-DIMETHYL AMINOAZOBENZENE	PA
EPA 8270 C	4-METHYLPHENOL (P-CRESOL)	PA	EPA 8270 C	4-NITROANILINE	PA
EPA 8270 C	4-NITROPHENOL	PA	EPA 8270 C	5-NITRO-O-TOLUIDINE	PA
EPA 8270 C	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA	EPA 8270 C	A-A-DIMETHYLPHENETHYLAMINE	PA
EPA 8270 C	ACENAPHTHENE	PA	EPA 8270 C	ACENAPHTHYLENE	PA
EPA 8270 C	ACETOPHENONE	PA	EPA 8270 C	ANILINE	PA
EPA 8270 C	ANTHRACENE	PA	EPA 8270 C	ARAMITE	PA
EPA 8270 C	BENZIDINE	PA	EPA 8270 C	BENZO(A)ANTHRACENE	PA
EPA 8270 C	BENZO(A)PYRENE	PA	EPA 8270 C	BENZO(G,H,I)PERYLENE	PA
EPA 8270 C	BENZO(K)FLUORANTHENE	PA	EPA 8270 C	BENZOIC ACID	PA
EPA 8270 C	BENZO[B]FLUORANTHENE	PA	EPA 8270 C	BENZYL ALCOHOL	PA
EPA 8270 C	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 8270 C	BIS(2-CHLOROETHYL) ETHER	PA
EPA 8270 C	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 8270 C	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 8270 C	BUTYL BENZYL PHTHALATE	PA	EPA 8270 C	CHLOROBENZILATE	PA
EPA 8270 C	CHRYSENE	PA	EPA 8270 C	DI-N-BUTYL PHTHALATE	PA
EPA 8270 C	DI-N-OCTYL PHTHALATE	PA	EPA 8270 C	DIALLATE	PA
EPA 8270 C	DIBENZ(A, J) ACRIDINE	PA	EPA 8270 C	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 C	DIBENZOFURAN	PA	EPA 8270 C	DIETHYL PHTHALATE	PA
EPA 8270 C	DIMETHOATE	PA	EPA 8270 C	DIMETHYL PHTHALATE	PA
EPA 8270 C	DIPHENYLAMINE	PA	EPA 8270 C	DISULFOTON	PA
EPA 8270 C	ETHYL METHANESULFONATE	PA	EPA 8270 C	FAMPHUR	PA
EPA 8270 C	FLUORANTHENE	PA	EPA 8270 C	FLUORENE	PA
EPA 8270 C	HEXACHLOROBENZENE	PA	EPA 8270 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8270 C	HEXACHLOROCYCLOPENTADIEN E	PA	EPA 8270 C	HEXACHLOROETHANE	PA
EPA 8270 C	HEXACHLOROPROPENE	PA	EPA 8270 C	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 C	ISODRIN	PA	EPA 8270 C	ISOPHORONE	PA
EPA 8270 C	ISOSAFROLE	PA	EPA 8270 C	KEPONE	PA
EPA 8270 C	METHAPYRILENE	PA	EPA 8270 C	METHYL METHANESULFONATE	PA
EPA 8270 C	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8270 C	N-NITROSO-DI-N-BUTYLAMINE	PA
EPA 8270 C	N-NITROSODI-N-PROPYLAMINE	PA	EPA 8270 C	N-NITROSODIETHYLAMINE	PA
EPA 8270 C	N-NITROSODIMETHYLAMINE	PA	EPA 8270 C	N-NITROSODIPHENYLAMINE	PA
EPA 8270 C	N-NITROSOMETHYLETHYLAMINE	PA	EPA 8270 C	N-NITROSOMORPHOLINE	PA
EPA 8270 C	N-NITROSOPIPERIDINE	PA	EPA 8270 C	N-NITROSOPYRROLIDINE	PA
EPA 8270 C	NAPHTHALENE	PA	EPA 8270 C	NITROBENZENE	PA
EPA 8270 C	NITROQUINOLINE-1-OXIDE	PA	EPA 8270 C	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
			EPA 8270 C	O-TOLUIDINE (2-METHYLANILINE)	PA
EPA 8270 C	PARATHION (PARATHION - ETHYL)	PA	EPA 8270 C	PENTACHLOROBENZENE	PA
EPA 8270 C	PENTACHLORONITROBENZENE	PA	EPA 8270 C	PENTACHLOROPHENOL	PA
EPA 8270 C	PHENACETIN	PA	EPA 8270 C	PHENANTHRENE	PA
EPA 8270 C	PHENOL	PA	EPA 8270 C	PHORATE	PA
EPA 8270 C	PHTHALIC ANHYDRIDE	PA	EPA 8270 C	PRONAMIDE (KERB)	PA
EPA 8270 C	PYRENE	PA	EPA 8270 C	PYRIDINE	PA
EPA 8270 C	SAFROLE	PA	EPA 8270 C	THIONAZIN (ZINOPHOS)	PA
EPA 8270 C	THIOPHENOL (BENZENETHIOL)	PA	EPA 8270 C	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA
EPA 8270 C SIM	2-METHYLNAPHTHALENE	PA	EPA 8270 C SIM	ACENAPHTHENE	PA
EPA 8270 C SIM	ACENAPHTHYLENE	PA	EPA 8270 C SIM	ANTHRACENE	PA
EPA 8270 C SIM	BENZO(A)ANTHRACENE	PA	EPA 8270 C SIM	BENZO(A)PYRENE	PA
EPA 8270 C SIM	BENZO(G,H,I)PERYLENE	PA	EPA 8270 C SIM	BENZO(K)FLUORANTHENE	PA
EPA 8270 C SIM	BENZO[B]FLUORANTHENE	PA	EPA 8270 C SIM	CHRYSENE	PA
EPA 8270 C SIM	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 C SIM	FLUORANTHENE	PA
EPA 8270 C SIM	FLUORENE	PA	EPA 8270 C SIM	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 C SIM	NAPHTHALENE	PA	EPA 8270 C SIM	PHENANTHRENE	PA
EPA 8270 C SIM	PYRENE	PA	EPA 8270 C SIM - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	PA	EPA 8270 D	1,2,4-TRICHLOROBENZENE	PA
EPA 8270 D	1,2-DICHLOROBENZENE	PA	EPA 8270 D	1,2-DIPHENYLHYDRAZINE	PA
EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8270 D	1,3-DICHLOROBENZENE	PA
EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8270 D	1,4-DICHLOROBENZENE	PA
EPA 8270 D	1,4-DINITROBENZENE	PA	EPA 8270 D	1,4-NAPHTHOQUINONE	PA
EPA 8270 D	1,4-PHENYLENEDIAMINE	PA	EPA 8270 D	1-CHLORONAPHTHALENE	PA
EPA 8270 D	1-NAPHTHYLAMINE	PA	EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	PA
EPA 8270 D	2,4,5-TRICHLOROPHENOL	PA	EPA 8270 D	2,4,6-TRICHLOROPHENOL	PA
EPA 8270 D	2,4-DICHLOROPHENOL	PA	EPA 8270 D	2,4-DIMETHYLPHENOL	PA
EPA 8270 D	2,4-DINITROPHENOL	PA	EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8270 D	2,6-DICHLOROPHENOL	PA	EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8270 D	2-ACETYLAMINOFLUORENE	PA	EPA 8270 D	2-CHLORONAPHTHALENE	PA
EPA 8270 D	2-CHLOROPHENOL	PA	EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 8270 D	2-METHYLNAPHTHALENE	PA	EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	PA
EPA 8270 D	2-NAPHTHYLAMINE	PA	EPA 8270 D	2-NITROANILINE	PA
EPA 8270 D	2-NITROPHENOL	PA	EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	PA
EPA 8270 D	3,3'-DICHLOROBENZIDINE	PA	EPA 8270 D	3,3'-DIMETHYLBENZIDINE	PA
EPA 8270 D	3-METHYLCHOLANTHRENE	PA	EPA 8270 D	3-METHYLPHENOL (M-CRESOL)	PA

VELAP Certificate No.: 2914

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	3-NITROANILINE	PA	EPA 8270 D	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA
EPA 8270 D	4-AMINOBIPHENYL	PA	EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	PA
EPA 8270 D	4-CHLORO-3-METHYLPHENOL	PA	EPA 8270 D	4-CHLOROANILINE	PA
EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	PA	EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	PA
EPA 8270 D	4-METHYLPHENOL (P-CRESOL)	PA	EPA 8270 D	4-NITROANILINE	PA
EPA 8270 D	4-NITROPHENOL	PA	EPA 8270 D	5-NITRO-O-TOLUIDINE	PA
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA	EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	PA
EPA 8270 D	ACENAPHTHENE	PA	EPA 8270 D	ACENAPHTHYLENE	PA
EPA 8270 D	ACETOPHENONE	PA	EPA 8270 D	ANILINE	PA
EPA 8270 D	ANTHRACENE	PA	EPA 8270 D	ARAMITE	PA
EPA 8270 D	BENZIDINE	PA	EPA 8270 D	BENZO(A)ANTHRACENE	PA
EPA 8270 D	BENZO(A)PYRENE	PA	EPA 8270 D	BENZO(G,H,I)PERYLENE	PA
EPA 8270 D	BENZO(K)FLUORANTHENE	PA	EPA 8270 D	BENZOIC ACID	PA
EPA 8270 D	BENZO[B]FLUORANTHENE	PA	EPA 8270 D	BENZYL ALCOHOL	PA
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	PA
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 8270 D	BUTYL BENZYL PHTHALATE	PA	EPA 8270 D	CHLOROBENZILATE	PA
EPA 8270 D	CHRYSENE	PA	EPA 8270 D	DI-N-BUTYL PHTHALATE	PA
EPA 8270 D	DI-N-OCTYL PHTHALATE	PA	EPA 8270 D	DIALLATE	PA
EPA 8270 D	DIBENZ(A, J) ACRIDINE	PA	EPA 8270 D	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 D	DIBENZOFURAN	PA	EPA 8270 D	DIETHYL PHTHALATE	PA
EPA 8270 D	DIMETHOATE	PA	EPA 8270 D	DIMETHYL PHTHALATE	PA
EPA 8270 D	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 8270 D	DIPHENYLAMINE	PA
EPA 8270 D	DISULFOTON	PA	EPA 8270 D	ETHYL METHANESULFONATE	PA
EPA 8270 D	FAMPHUR	PA	EPA 8270 D	FLUORANTHENE	PA
EPA 8270 D	FLUORENE	PA	EPA 8270 D	HEXACHLOROBENZENE	PA
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	PA
EPA 8270 D	HEXACHLOROETHANE	PA	EPA 8270 D	HEXACHLOROPROPENE	PA
EPA 8270 D	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 D	ISODRIN	PA
EPA 8270 D	ISOPHORONE	PA	EPA 8270 D	ISOSAFROLE	PA
EPA 8270 D	KEPONE	PA	EPA 8270 D	METHAPYRILENE	PA
EPA 8270 D	METHYL METHANESULFONATE	PA	EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	PA

Scope of Accreditation

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Expiration Date: June 14, 2015

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	N-NITROSODIETHYLAMINE	PA	EPA 8270 D	N-NITROSODIMETHYLAMINE	PA
EPA 8270 D	N-NITROSODIPHENYLAMINE	PA	EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 D	N-NITROSOMORPHOLINE	PA	EPA 8270 D	N-NITROSOPIPERIDINE	PA
EPA 8270 D	N-NITROSOPYRROLIDINE	PA	EPA 8270 D	NAPHTHALENE	PA
EPA 8270 D	NITROBENZENE	PA	EPA 8270 D	NITROQUINOLINE-1-OXIDE	PA
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA	EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	PA
EPA 8270 D	PARATHION (PARATHION - ETHYL)	PA	EPA 8270 D	PENTACHLOROBENZENE	PA
EPA 8270 D	PENTACHLORONITROBENZENE	PA	EPA 8270 D	PENTACHLOROPHENOL	PA
EPA 8270 D	PHENACETIN	PA	EPA 8270 D	PHENANTHRENE	PA
EPA 8270 D	PHENOL	PA	EPA 8270 D	PHORATE	PA
EPA 8270 D	PHTHALIC ANHYDRIDE	PA	EPA 8270 D	PRONAMIDE (KERB)	PA
EPA 8270 D	PYRENE	PA	EPA 8270 D	SAFROLE	PA
EPA 8270 D	THIONAZIN (ZINOPHOS)	PA	EPA 8270 D	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA
EPA 8270 D - EXTENDED	1,1-BIPHENYL	PA	EPA 8270 D - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8270 D - EXTENDED	ATRAZINE	PA	EPA 8270 D - EXTENDED	BENZALDEHYDE	PA
EPA 8270 D - EXTENDED	CAPROLACTAM	PA	EPA 8270 D - EXTENDED	CARBAZOLE	PA
EPA 8270 D - EXTENDED	PYRIDINE	PA	EPA 8270 D SIM	2-METHYLNAPHTHALENE	PA
EPA 8270 D SIM	ACENAPHTHENE	PA	EPA 8270 D SIM	ACENAPHTHYLENE	PA
EPA 8270 D SIM	ANTHRACENE	PA	EPA 8270 D SIM	BENZO(A)ANTHRACENE	PA
EPA 8270 D SIM	BENZO(A)PYRENE	PA	EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	PA
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	PA	EPA 8270 D SIM	BENZO[B]FLUORANTHENE	PA
EPA 8270 D SIM	CHRYSENE	PA	EPA 8270 D SIM	FLUORANTHENE	PA
EPA 8270 D SIM	FLUORENE	PA	EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 D SIM	NAPHTHALENE	PA	EPA 8270 D SIM	PHENANTHRENE	PA
EPA 8270 D SIM	PYRENE	PA	EPA 8270 D SIM - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8270 D SIM - EXTENDED	DIBENZO(A, H) PYRENE	PA	EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA
EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA	EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA
EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA	EPA 8290 A	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA
EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA	EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA
EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA	EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA
EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA	EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (1,2,3,7,8,9-HXCDF)	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZO -P-DIOXIN (1,2,3,7,8-PECDD)	PA	EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZO FURAN (1,2,3,7,8-PECDF)	PA
EPA 8290 A	2,3,4,6,7,8-HEXACHLORODIBENZO FURAN (2,3,4,6,7,8-HXCDF)	PA	EPA 8290 A	2,3,4,7,8-PENTACHLORODIBENZO FURAN	PA
EPA 8290 A	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA	EPA 8290 A	2,3,7,8-TETRACHLORODIBENZOF URAN (2,3,7,8-TCDF)	PA
EPA 8315 A	ACETALDEHYDE	PA	EPA 8315 A	ACROLEIN (PROPENAL)	PA
EPA 8315 A	BENZALDEHYDE	PA	EPA 8315 A	BUTYLALDEHYDE (BUTANAL)	PA
EPA 8315 A	CROTONALDEHYDE	PA	EPA 8315 A	FORMALDEHYDE	PA
EPA 8315 A	HEXANALDEHYDE (HEXANAL)	PA	EPA 8315 A	ISOVALERALDEHYDE	PA
EPA 8315 A	M-TOLUALDEHYDE (1,3-TOLUALDEHYDE)	PA	EPA 8315 A	O-TOLUALDEHYDE (1,2-TOLUALDEHYDE)	PA
EPA 8315 A	P-TOLUALDEHYDE (1,4-TOLUALDEHYDE)	PA	EPA 8315 A	PENTANAL (VALERALDEHYDE)	PA
EPA 8315 A	PROPIONALDEHYDE (PROPANAL)	PA	EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA
EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	PA
EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	PA	EPA 8330 A	2-NITROTOLUENE	PA
EPA 8330 A	3-NITROTOLUENE	PA	EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	PA
EPA 8330 A	4-NITROTOLUENE	PA	EPA 8330 A	METHYL-2,4,6-TRINITROPHENYLN ITRAMINE (TETRYL)	PA
EPA 8330 A	NITROBENZENE	PA	EPA 8330 A	NITROGLYCERIN	PA
EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO -1,3,5,7-TETRAZOCINE (HMX)	PA	EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3, 5-TRIAZINE)	PA
EPA 9012 A	TOTAL CYANIDE	PA	EPA 9012 B	TOTAL CYANIDE	PA
EPA 9040 C	PH	PA	EPA 9050 A	CONDUCTIVITY	PA
EPA 9056 A	BROMIDE	PA	EPA 9056 A	CHLORIDE	PA
EPA 9056 A	FLUORIDE	PA	EPA 9056 A	NITRATE AS N	PA
EPA 9056 A	NITRITE	PA	EPA 9056 A	ORTHOPHOSPHATE AS P	PA
EPA 9056 A	SULFATE	PA	EPA 9066	TOTAL PHENOLICS	PA
EPA 9095 B	FREE LIQUID	PA	RSK-175	ETHANE	PA
RSK-175	ETHENE	PA	RSK-175	METHANE	PA
SM 2120 B-2001	COLOR	PA	SM 2310 B-1997	ACIDITY, AS CACO3	PA
SM 2320 B-1997	ALKALINITY AS CACO3	PA	SM 2340 B-1997	TOTAL HARDNESS AS CACO3	PA
SM 2340 C-1997	TOTAL HARDNESS AS CACO3	PA	SM 2510 B-1997	CONDUCTIVITY	PA
SM 2540 B-1997	RESIDUE-TOTAL	PA	SM 2540 C-1997	RESIDUE-FILTERABLE (TDS)	PA
SM 2540 D-1997	RESIDUE-NONFILTERABLE (TSS)	PA	SM 2540 F-1997	RESIDUE-SETTLEABLE	PA
SM 3500-CR B-2009	CHROMIUM VI	PA	SM 4500-CN^- C-1999	CYANIDE	PA
SM 4500-CN^- E-1999	CYANIDE	PA	SM 4500-F^- B-1997	FLUORIDE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
SM 4500-F⁻ C-1997	FLUORIDE	PA	SM 4500-NH3 B-1997	AMMONIA AS N	PA
SM 4500-NH3 D-1997	AMMONIA AS N	PA	SM 4500-P E-1999	ORTHOPHOSPHATE AS P	PA
SM 4500-P F-1999	PHOSPHORUS, TOTAL	PA	SM 4500-S2⁻ D-2000	SULFIDE	PA
SM 4500-SIO2 C-1997	SILICA AS SIO2	PA	SM 5210 B-2001	BIOCHEMICAL OXYGEN DEMAND	PA
SM 5210 B-2001	CARBONACEOUS BOD, CBOD	PA	SM 5310 C-2000	TOTAL ORGANIC CARBON	PA
SM 5540 C-2000	SURFACTANTS - MBAS	PA	SM 9222 D-1997	FECAL COLIFORMS	PA

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	PA	EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	PA
EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	PA	EPA 1668 A	2,2',3,3',4,4',5,5',6-NONACHLOROBIPHENYL (BZ-206)	PA
EPA 1668 A	2,2',3,3',4,4',5,5'-OCTACHLOROBIPHENYL (BZ-194)	PA	EPA 1668 A	2,2',3,3',4,4',5,6'-OCTACHLOROBIPHENYL (BZ-196)	PA
EPA 1668 A	2,2',3,3',4,4',5,6,6'-NONACHLOROBIPHENYL (BZ-207)	PA	EPA 1668 A	2,2',3,3',4,4',5,6-OCTACHLOROBIPHENYL BZ-195)	PA
EPA 1668 A	2,2',3,3',4,4',5-HEPTACHLOROBIPHENYL (BZ-170)	PA	EPA 1668 A	2,2',3,3',4,4',6,6'-OCTACHLOROBIPHENYL (BZ-197)	PA
EPA 1668 A	2,2',3,3',4,4',6-HEPTACHLOROBIPHENYL (BZ-171)	PA	EPA 1668 A	2,2',3,3',4,4'-HEXACHLOROBIPHENYL (BZ-128)	PA
EPA 1668 A	2,2',3,3',4,5',6'-HEPTACHLOROBIPHENYL (BZ-177)	PA	EPA 1668 A	2,2',3,3',4,5',6,6'-OCTACHLOROBIPHENYL (BZ-201)	PA
EPA 1668 A	2,2',3,3',4,5',6-HEPTACHLOROBIPHENYL (BZ-175)	PA	EPA 1668 A	2,2',3,3',4,5'-HEXACHLOROBIPHENYL (BZ-130)	PA
EPA 1668 A	2,2',3,3',4,5,5',6'-OCTACHLOROBIPHENYL (BZ-199)	PA	EPA 1668 A	2,2',3,3',4,5,5',6,6'-NONACHLOROBIPHENYL (BZ-208)	PA
EPA 1668 A	2,2',3,3',4,5,5',6-OCTACHLOROBIPHENYL (BZ-198)	PA	EPA 1668 A	2,2',3,3',4,5,5'-HEPTACHLOROBIPHENYL (BZ-172)	PA
EPA 1668 A	2,2',3,3',4,5,6'-HEPTACHLOROBIPHENYL (BZ-174)	PA	EPA 1668 A	2,2',3,3',4,5,6,6'-OCTACHLOROBIPHENYL (BZ-200)	PA
EPA 1668 A	2,2',3,3',4,5,6-HEPTACHLOROBIPHENYL (BZ-173)	PA	EPA 1668 A	2,2',3,3',4,5-HEXACHLOROBIPHENYL (BZ-129)	PA
EPA 1668 A	2,2',3,3',4,6'-HEXACHLOROBIPHENYL (BZ-132)	PA	EPA 1668 A	2,2',3,3',4,6,6'-HEPTACHLOROBIPHENYL (BZ-176)	PA
EPA 1668 A	2,2',3,3',4,6-HEXACHLOROBIPHENYL (BZ-131)	PA	EPA 1668 A	2,2',3,3',4-PENTACHLOROBIPHENYL (BZ-82)	PA
EPA 1668 A	2,2',3,3',5,5',6,6'-OCTACHLOROBIPHENYL (BZ-202)	PA	EPA 1668 A	2,2',3,3',5,5',6-HEPTACHLOROBIPHENYL (BZ-178)	PA
EPA 1668 A	2,2',3,3',5,5'-HEXACHLOROBIPHENYL (BZ-133)	PA	EPA 1668 A	2,2',3,3',5,6'-HEXACHLOROBIPHENYL (BZ-135)	PA
EPA 1668 A	2,2',3,3',5,6,6'-HEPTACHLOROBIPHENYL (BZ-179)	PA	EPA 1668 A	2,2',3,3',5,6-HEXACHLOROBIPHENYL (BZ-134)	PA
EPA 1668 A	2,2',3,3',5-PENTACHLOROBIPHENYL (BZ-83)	PA	EPA 1668 A	2,2',3,3',6,6'-HEXACHLOROBIPHENYL (BZ-136)	PA

Commonwealth of Virginia

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1668 A	2,2',3,3',6-PENTACHLOROBIPHENYL (BZ-84)	PA	EPA 1668 A	2,2',3,3'-TETRACHLOROBIPHENYL (BZ-40)	PA
EPA 1668 A	2,2',3,4',5',6-HEXACHLOROBIPHENYL (BZ-149)	PA	EPA 1668 A	2,2',3,4',5'-PENTACHLOROBIPHENYL (BZ-97)	PA
EPA 1668 A	2,2',3,4',5,5',6-HEPTACHLOROBIPHENYL (BZ-187)	PA	EPA 1668 A	2,2',3,4',5,5'-HEXACHLOROBIPHENYL (BZ-146)	PA
EPA 1668 A	2,2',3,4',5,6'-HEXACHLOROBIPHENYL (BZ-148)	PA	EPA 1668 A	2,2',3,4',5,6,6'-HEPTACHLOROBIPHENYL (BZ-188)	PA
EPA 1668 A	2,2',3,4',5,6-HEXACHLOROBIPHENYL (BZ-147)	PA	EPA 1668 A	2,2',3,4',5-PENTACHLOROBIPHENYL (BZ-90)	PA
EPA 1668 A	2,2',3,4',6'-PENTACHLOROBIPHENYL (BZ-98)	PA	EPA 1668 A	2,2',3,4',6,6'-HEXACHLOROBIPHENYL (BZ-150)	PA
EPA 1668 A	2,2',3,4',6-PENTACHLOROBIPHENYL (BZ-91)	PA	EPA 1668 A	2,2',3,4'-TETRACHLOROBIPHENYL (BZ-42)	PA
EPA 1668 A	2,2',3,4,4',5',6-HEPTACHLOROBIPHENYL (BZ-183)	PA	EPA 1668 A	2,2',3,4,4',5'-HEXACHLOROBIPHENYL (BZ-138)	PA
EPA 1668 A	2,2',3,4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-203)	PA	EPA 1668 A	2,2',3,4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-180)	PA
EPA 1668 A	2,2',3,4,4',5,6'-HEPTACHLOROBIPHENYL (BZ-182)	PA	EPA 1668 A	2,2',3,4,4',5,6,6'-OCTACHLOROBIPHENYL (BZ-204)	PA
EPA 1668 A	2,2',3,4,4',5,6-HEPTACHLOROBIPHENYL (BZ-181)	PA	EPA 1668 A	2,2',3,4,4',5-HEXACHLOROBIPHENYL (BZ-137)	PA
EPA 1668 A	2,2',3,4,4',6'-HEXACHLOROBIPHENYL (BZ-140)	PA	EPA 1668 A	2,2',3,4,4',6,6'-HEPTACHLOROBIPHENYL (BZ-184)	PA
EPA 1668 A	2,2',3,4,4',6-HEXACHLOROBIPHENYL (BZ-139)	PA	EPA 1668 A	2,2',3,4,4'-PENTACHLOROBIPHENYL (BZ-85)	PA
EPA 1668 A	2,2',3,4,5',6-HEXACHLOROBIPHENYL (BZ-144)	PA	EPA 1668 A	2,2',3,4,5'-PENTACHLOROBIPHENYL (BZ-87)	PA
EPA 1668 A	2,2',3,4,5,5',6-HEPTACHLOROBIPHENYL (BZ-185)	PA	EPA 1668 A	2,2',3,4,5,5'-HEXACHLOROBIPHENYL (BZ-141)	PA
EPA 1668 A	2,2',3,4,5,6'-HEXACHLOROBIPHENYL (BZ-143)	PA	EPA 1668 A	2,2',3,4,5,6,6'-HEPTACHLOROBIPHENYL (BZ-186)	PA
EPA 1668 A	2,2',3,4,5,6-HEXACHLOROBIPHENYL (BZ-142)	PA	EPA 1668 A	2,2',3,4,5-PENTACHLOROBIPHENYL (BZ-86)	PA
EPA 1668 A	2,2',3,4,6'-PENTACHLOROBIPHENYL (BZ-89)	PA	EPA 1668 A	2,2',3,4,6,6'-HEXACHLOROBIPHENYL (BZ-145)	PA
EPA 1668 A	2,2',3,4,6-PENTACHLOROBIPHENYL (BZ-88)	PA	EPA 1668 A	2,2',3,4-TETRACHLOROBIPHENYL (BZ-41)	PA
EPA 1668 A	2,2',3,5',6-PENTACHLOROBIPHENYL (BZ-95)	PA	EPA 1668 A	2,2',3,5'-TETRACHLOROBIPHENYL (BZ-44)	PA
EPA 1668 A	2,2',3,5,5',6-HEXACHLOROBIPHENYL (BZ-151)	PA	EPA 1668 A	2,2',3,5,5'-PENTACHLOROBIPHENYL (BZ-92)	PA
EPA 1668 A	2,2',3,5,6'-PENTACHLOROBIPHENYL (BZ-94)	PA	EPA 1668 A	2,2',3,5,6,6'-HEXACHLOROBIPHENYL (BZ-152)	PA
EPA 1668 A	2,2',3,5,6-PENTACHLOROBIPHENYL (BZ-93)	PA	EPA 1668 A	2,2',3,5-TETRACHLOROBIPHENYL (BZ-43)	PA
EPA 1668 A	2,2',3,6'-TETRACHLOROBIPHENYL (BZ-46)	PA	EPA 1668 A	2,2',3,6,6'-PENTACHLOROBIPHENYL (BZ-96)	PA
EPA 1668 A	2,2',3,6-TETRACHLOROBIPHENYL (BZ-45)	PA	EPA 1668 A	2,2',3-TRICHLOROBIPHENYL (BZ-16)	PA

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EPA 1668 A	2,2',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-153)	PA	EPA 1668 A	2,2',4,4',5,6'-HEXACHLOROBIPHENYL (BZ-154)	PA
EPA 1668 A	2,2',4,4',5-PENTACHLOROBIPHENYL (BZ-99)	PA	EPA 1668 A	2,2',4,4',6,6'-HEXACHLOROBIPHENYL (BZ-155)	PA
EPA 1668 A	2,2',4,4',6-PENTACHLOROBIPHENYL (BZ-100)	PA	EPA 1668 A	2,2',4,4'-TETRACHLOROBIPHENYL (BZ-47)	PA
EPA 1668 A	2,2',4,5',6-PENTACHLOROBIPHENYL (BZ-103)	PA	EPA 1668 A	2,2',4,5'-TETRACHLOROBIPHENYL (BZ-49)	PA
EPA 1668 A	2,2',4,5,5'-PENTACHLOROBIPHENYL (BZ-101)	PA	EPA 1668 A	2,2',4,5,6'-PENTACHLOROBIPHENYL (BZ-102)	PA
EPA 1668 A	2,2',4,5-TETRACHLOROBIPHENYL (BZ-48)	PA	EPA 1668 A	2,2',4,6'-TETRACHLOROBIPHENYL (BZ-51)	PA
EPA 1668 A	2,2',4,6,6'-PENTACHLOROBIPHENYL (BZ-104)	PA	EPA 1668 A	2,2',4,6-TETRACHLOROBIPHENYL (BZ-50)	PA
EPA 1668 A	2,2',4-TRICHLOROBIPHENYL (BZ-17)	PA	EPA 1668 A	2,2',5,5'-TETRACHLOROBIPHENYL (BZ-52)	PA
EPA 1668 A	2,2',5,6'-TETRACHLOROBIPHENYL (BZ-53)	PA	EPA 1668 A	2,2',5-TRICHLOROBIPHENYL (BZ-18)	PA
EPA 1668 A	2,2',6,6'-TETRACHLOROBIPHENYL (BZ-54)	PA	EPA 1668 A	2,2',6-TRICHLOROBIPHENYL (BZ-19)	PA
EPA 1668 A	2,2'-DICHLOROBIPHENYL (BZ-4)	PA	EPA 1668 A	2,3',4',5',6-PENTACHLOROBIPHENYL (BZ-125)	PA
EPA 1668 A	2,3',4',5'-TETRACHLOROBIPHENYL (BZ-76)	PA	EPA 1668 A	2,3',4',5,5'-PENTACHLOROBIPHENYL (BZ-124)	PA
EPA 1668 A	2,3',4',5-TETRACHLOROBIPHENYL (BZ-70)	PA	EPA 1668 A	2,3',4',6-TETRACHLOROBIPHENYL (BZ-71)	PA
EPA 1668 A	2,3',4'-TRICHLOROBIPHENYL (BZ-33)	PA	EPA 1668 A	2,3',4,4',5',6-HEXACHLOROBIPHENYL (BZ-168)	PA
EPA 1668 A	2,3',4,4',5'-PENTACHLOROBIPHENYL (BZ-123)	PA	EPA 1668 A	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-167)	PA
EPA 1668 A	2,3',4,4',5-PENTACHLOROBIPHENYL (BZ-118)	PA	EPA 1668 A	2,3',4,4',6-PENTACHLOROBIPHENYL (BZ-119)	PA
EPA 1668 A	2,3',4,4'-TETRACHLOROBIPHENYL (BZ-66)	PA	EPA 1668 A	2,3',4,5',6-PENTACHLOROBIPHENYL (BZ-121)	PA
EPA 1668 A	2,3',4,5'-TETRACHLOROBIPHENYL (BZ-68)	PA	EPA 1668 A	2,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-120)	PA
EPA 1668 A	2,3',4,5-TETRACHLOROBIPHENYL (BZ-67)	PA	EPA 1668 A	2,3',4,6-TETRACHLOROBIPHENYL (BZ-69)	PA
EPA 1668 A	2,3',4-TRICHLOROBIPHENYL (BZ-25)	PA	EPA 1668 A	2,3',5',6-TETRACHLOROBIPHENYL (BZ-73)	PA
EPA 1668 A	2,3',5'-TRICHLOROBIPHENYL (BZ-34)	PA	EPA 1668 A	2,3',5,5'-TETRACHLOROBIPHENYL (BZ-72)	PA
EPA 1668 A	2,3',5-TRICHLOROBIPHENYL (BZ-26)	PA	EPA 1668 A	2,3',6-TRICHLOROBIPHENYL (BZ-27)	PA
EPA 1668 A	2,3'-DICHLOROBIPHENYL (BZ-6)	PA	EPA 1668 A	2,3,3',4',5',6-HEXACHLOROBIPHENYL (BZ-164)	PA
EPA 1668 A	2,3,3',4',5'-PENTACHLOROBIPHENYL (BZ-122)	PA	EPA 1668 A	2,3,3',4',5,5',6-HEPTACHLOROBIPHENYL (BZ-193)	PA
EPA 1668 A	2,3,3',4',5,5'-HEXACHLOROBIPHENYL (BZ-162)	PA	EPA 1668 A	2,3,3',4',5,6-HEXACHLOROBIPHENYL (BZ-163)	PA

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EPA 1668 A	2,3,3',4',5-PENTACHLOROBIPHENYL (BZ-107)	PA	EPA 1668 A	2,3,3',4',6-PENTACHLOROBIPHENYL (BZ-110)	PA
EPA 1668 A	2,3,3',4'-TETRACHLOROBIPHENYL (BZ-56)	PA	EPA 1668 A	2,3,3',4,4',5',6-HEPTACHLOROBIPHENYL (BZ-191)	PA
EPA 1668 A	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (BZ-157)	PA	EPA 1668 A	2,3,3',4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-205)	PA
EPA 1668 A	2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-189)	PA	EPA 1668 A	2,3,3',4,4',5,6-HEPTACHLOROBIPHENYL (BZ-190)	PA
EPA 1668 A	2,3,3',4,4',5-HEXACHLOROBIPHENYL (BZ-156)	PA	EPA 1668 A	2,3,3',4,4',6-HEXACHLOROBIPHENYL (BZ-158)	PA
EPA 1668 A	2,3,3',4,4'-PENTACHLOROBIPHENYL (BZ-105)	PA	EPA 1668 A	2,3,3',4,5',6-HEXACHLOROBIPHENYL (BZ-161)	PA
EPA 1668 A	2,3,3',4,5'-PENTACHLOROBIPHENYL (BZ-108)	PA	EPA 1668 A	2,3,3',4,5,5',6-HEPTACHLOROBIPHENYL (BZ-192)	PA
EPA 1668 A	2,3,3',4,5,5'-HEXACHLOROBIPHENYL (BZ-159)	PA	EPA 1668 A	2,3,3',4,5,6-HEXACHLOROBIPHENYL (BZ-160)	PA
EPA 1668 A	2,3,3',4,5-PENTACHLOROBIPHENYL (BZ-106)	PA	EPA 1668 A	2,3,3',4,6-PENTACHLOROBIPHENYL (BZ-109)	PA
EPA 1668 A	2,3,3',4-TETRACHLOROBIPHENYL (BZ-55)	PA	EPA 1668 A	2,3,3',5',6-PENTACHLOROBIPHENYL (BZ-113)	PA
EPA 1668 A	2,3,3',5'-TETRACHLOROBIPHENYL (BZ-58)	PA	EPA 1668 A	2,3,3',5,5',6-HEXACHLOROBIPHENYL (BZ-165)	PA
EPA 1668 A	2,3,3',5,5'-PENTACHLOROBIPHENYL (BZ-111)	PA	EPA 1668 A	2,3,3',5,6-PENTACHLOROBIPHENYL (BZ-112)	PA
EPA 1668 A	2,3,3',5-TETRACHLOROBIPHENYL (BZ-57)	PA	EPA 1668 A	2,3,3',6-TETRACHLOROBIPHENYL (BZ-59)	PA
EPA 1668 A	2,3,3'-TRICHLOROBIPHENYL (BZ-20)	PA	EPA 1668 A	2,3,4',5,6-PENTACHLOROBIPHENYL (BZ-117)	PA
EPA 1668 A	2,3,4',5-TETRACHLOROBIPHENYL (BZ-63)	PA	EPA 1668 A	2,3,4',6-TETRACHLOROBIPHENYL (BZ-64)	PA
EPA 1668 A	2,3,4'-TRICHLOROBIPHENYL (BZ-22)	PA	EPA 1668 A	2,3,4,4',5,6-HEXACHLOROBIPHENYL (BZ-166)	PA
EPA 1668 A	2,3,4,4',5-PENTACHLOROBIPHENYL (BZ-114)	PA	EPA 1668 A	2,3,4,4',6-PENTACHLOROBIPHENYL (BZ-115)	PA
EPA 1668 A	2,3,4,4'-TETRACHLOROBIPHENYL (BZ-60)	PA	EPA 1668 A	2,3,4,5,6-PENTACHLOROBIPHENYL (BZ-116)	PA
EPA 1668 A	2,3,4,5-TETRACHLOROBIPHENYL (BZ-61)	PA	EPA 1668 A	2,3,4,6-TETRACHLOROBIPHENYL (BZ-62)	PA
EPA 1668 A	2,3,4-TRICHLOROBIPHENYL (BZ-21)	PA	EPA 1668 A	2,3,5,6-TETRACHLOROBIPHENYL (BZ-65)	PA
EPA 1668 A	2,3,5-TRICHLOROBIPHENYL (BZ-23)	PA	EPA 1668 A	2,3,6-TRICHLOROBIPHENYL (BZ-24)	PA
EPA 1668 A	2,3-DICHLOROBIPHENYL (BZ-5)	PA	EPA 1668 A	2,4',5-TRICHLOROBIPHENYL (BZ-31)	PA
EPA 1668 A	2,4',6-TRICHLOROBIPHENYL (BZ-32)	PA	EPA 1668 A	2,4'-DICHLOROBIPHENYL (BZ-8)	PA
EPA 1668 A	2,4,4',5-TETRACHLOROBIPHENYL (BZ-74)	PA	EPA 1668 A	2,4,4',6-TETRACHLOROBIPHENYL (BZ-75)	PA
EPA 1668 A	2,4,4'-TRICHLOROBIPHENYL (BZ-28)	PA	EPA 1668 A	2,4,5-TRICHLOROBIPHENYL (BZ-29)	PA

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EPA 1668 A	2,4,6-TRICHLOROBIPHENYL (BZ-30)	PA	EPA 1668 A	2,4-DICHLOROBIPHENYL (BZ-7)	PA
EPA 1668 A	2,5-DICHLOROBIPHENYL (BZ-9)	PA	EPA 1668 A	2,6-DICHLOROBIPHENYL (BZ-10)	PA
EPA 1668 A	2-CHLOROBIPHENYL (BZ-1)	PA	EPA 1668 A	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-169)	PA
EPA 1668 A	3,3',4,4',5-PENTACHLOROBIPHENYL (BZ-126)	PA	EPA 1668 A	3,3',4,4'-TETRACHLOROBIPHENYL (BZ-77)	PA
EPA 1668 A	3,3',4,5'-TETRACHLOROBIPHENYL (BZ-79)	PA	EPA 1668 A	3,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-127)	PA
EPA 1668 A	3,3',4,5-TETRACHLOROBIPHENYL (BZ-78)	PA	EPA 1668 A	3,3',4-TRICHLOROBIPHENYL (BZ-35)	PA
EPA 1668 A	3,3',5,5'-TETRACHLOROBIPHENYL (BZ-80)	PA	EPA 1668 A	3,3',5-TRICHLOROBIPHENYL (BZ-36)	PA
EPA 1668 A	3,3'-DICHLOROBIPHENYL (BZ-11)	PA	EPA 1668 A	3,4',5-TRICHLOROBIPHENYL (BZ-39)	PA
EPA 1668 A	3,4'-DICHLOROBIPHENYL (BZ-13)	PA	EPA 1668 A	3,4,4',5-TETRACHLOROBIPHENYL (BZ-81)	PA
EPA 1668 A	3,4,4'-TRICHLOROBIPHENYL (BZ-37)	PA	EPA 1668 A	3,4,5-TRICHLOROBIPHENYL (BZ-38)	PA
EPA 1668 A	3,4-DICHLOROBIPHENYL (BZ-12)	PA	EPA 1668 A	3,5-DICHLOROBIPHENYL (BZ-14)	PA
EPA 1668 A	3-CHLOROBIPHENYL (BZ-2)	PA	EPA 1668 A	4,4'-DICHLOROBIPHENYL (BZ-15)	PA
EPA 1668 A	4-CHLOROBIPHENYL (BZ-3)	PA	EPA 1668 A	DECACHLOROBIPHENYL (BZ-209)	PA
EPA 3010 A	PREP: ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	PA	EPA 3050 B	PREP: ACID DIGESTION OF SEDIMENTS, SLUDGES, AND SOILS	PA
EPA 3540 C	PREP: SOXHLET EXTRACTION	PA	EPA 3546	PREP: MICROWAVE EXTRACTION	PA
EPA 3550 B	PREP: ULTRASONIC EXTRACTION	PA	EPA 3620 B	PREP: FLORISIL CLEANUP	PA
EPA 3630 C	PREP: SILICA GEL CLEANUP	PA	EPA 3640 A	PREP: GEL PERMEATION CLEANUP	PA
EPA 3660 B	PREP: SULFUR CLEANUP	PA	EPA 3665 A	SULFURIC ACID/PERMANGANATE CLEAN-UP	PA
EPA 5030 B	PREP: PURGE AND TRAP FOR AQUEOUS SAMPLES	PA	EPA 5035	PREP: CLOSED-SYSTEM PURGE AND TRAP AND EXTRACTION	PA
EPA 6010 B	ALUMINUM	PA	EPA 6010 B	ANTIMONY	PA
EPA 6010 B	ARSENIC	PA	EPA 6010 B	BARIUM	PA
EPA 6010 B	BERYLLIUM	PA	EPA 6010 B	BORON	PA
EPA 6010 B	CADMIUM	PA	EPA 6010 B	CALCIUM	PA
EPA 6010 B	CHROMIUM	PA	EPA 6010 B	COBALT	PA
EPA 6010 B	COPPER	PA	EPA 6010 B	IRON	PA
EPA 6010 B	LEAD	PA	EPA 6010 B	MAGNESIUM	PA
EPA 6010 B	MANGANESE	PA	EPA 6010 B	MOLYBDENUM	PA
EPA 6010 B	NICKEL	PA	EPA 6010 B	POTASSIUM	PA
EPA 6010 B	SELENIUM	PA	EPA 6010 B	SILVER	PA
EPA 6010 B	SODIUM	PA	EPA 6010 B	STRONTIUM	PA
EPA 6010 B	THALLIUM	PA	EPA 6010 B	TIN	PA

Scope of Accreditation

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EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 6010 B	TITANIUM	PA	EPA 6010 B	VANADIUM	PA
EPA 6010 B	ZINC	PA	EPA 6010 C	ALUMINUM	PA
EPA 6010 C	ANTIMONY	PA	EPA 6010 C	ARSENIC	PA
EPA 6010 C	BARIUM	PA	EPA 6010 C	BERYLLIUM	PA
EPA 6010 C	BORON	PA	EPA 6010 C	CADMIUM	PA
EPA 6010 C	CALCIUM	PA	EPA 6010 C	CHROMIUM	PA
EPA 6010 C	COBALT	PA	EPA 6010 C	COPPER	PA
EPA 6010 C	IRON	PA	EPA 6010 C	LEAD	PA
EPA 6010 C	MAGNESIUM	PA	EPA 6010 C	MANGANESE	PA
EPA 6010 C	MOLYBDENUM	PA	EPA 6010 C	NICKEL	PA
EPA 6010 C	POTASSIUM	PA	EPA 6010 C	SELENIUM	PA
EPA 6010 C	SILVER	PA	EPA 6010 C	SODIUM	PA
EPA 6010 C	STRONTIUM	PA	EPA 6010 C	THALLIUM	PA
EPA 6010 C	TIN	PA	EPA 6010 C	TITANIUM	PA
EPA 6010 C	VANADIUM	PA	EPA 6010 C	ZINC	PA
EPA 6020 A	ALUMINUM	PA	EPA 6020 A	ANTIMONY	PA
EPA 6020 A	ARSENIC	PA	EPA 6020 A	BERYLLIUM	PA
EPA 6020 A	CADMIUM	PA	EPA 6020 A	CALCIUM	PA
EPA 6020 A	CHROMIUM	PA	EPA 6020 A	COBALT	PA
EPA 6020 A	COPPER	PA	EPA 6020 A	IRON	PA
EPA 6020 A	LEAD	PA	EPA 6020 A	MAGNESIUM	PA
EPA 6020 A	MANGANESE	PA	EPA 6020 A	NICKEL	PA
EPA 6020 A	POTASSIUM	PA	EPA 6020 A	SELENIUM	PA
EPA 6020 A	SILVER	PA	EPA 6020 A	SODIUM	PA
EPA 6020 A	THALLIUM	PA	EPA 6020 A	VANADIUM	PA
EPA 6020 A	ZINC	PA	EPA 6020 A - EXTENDED	BORON	PA
EPA 6020 A - EXTENDED	STRONTIUM	PA	EPA 6020 A - EXTENDED	TIN	PA
EPA 6020 A - EXTENDED	TITANIUM	PA	EPA 6850	PERCHLORATE	PA
EPA 7196 A	CHROMIUM VI	PA	EPA 7471 A	MERCURY	PA
EPA 7471 B	MERCURY	PA	EPA 8015 B	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 B	ETHANOL	PA	EPA 8015 B	ETHYLENE GLYCOL	PA
EPA 8015 B	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 B	METHANOL	PA	EPA 8015 B	TERT-BUTYL ALCOHOL	PA
EPA 8015 C	ETHANOL	PA	EPA 8015 C	ETHYLENE GLYCOL	PA
EPA 8015 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8015 C	METHANOL	PA
EPA 8015 C	TERT-BUTYL ALCOHOL	PA	EPA 8015 D - EXTENDED	FORMIC ACID	PA

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EPA 8021 B	BENZENE	PA	EPA 8021 B	ETHYLBENZENE	PA
EPA 8021 B	ISOPROPYLBENZENE	PA	EPA 8021 B	M+P-XYLENE	PA
EPA 8021 B	NAPHTHALENE	PA	EPA 8021 B	O-XYLENE	PA
EPA 8021 B	TOLUENE	PA	EPA 8021 B	XYLENE (TOTAL)	PA
EPA 8021 B - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8081 A	4,4'-DDD	PA
EPA 8081 A	4,4'-DDE	PA	EPA 8081 A	4,4'-DDT	PA
EPA 8081 A	ALDRIN	PA	EPA 8081 A	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA	EPA 8081 A	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	CHLORDANE (TECH.)	PA	EPA 8081 A	DELTA-BHC	PA
EPA 8081 A	DIELDRIN	PA	EPA 8081 A	ENDOSULFAN I	PA
EPA 8081 A	ENDOSULFAN II	PA	EPA 8081 A	ENDOSULFAN SULFATE	PA
EPA 8081 A	ENDRIN	PA	EPA 8081 A	ENDRIN ALDEHYDE	PA
EPA 8081 A	ENDRIN KETONE	PA	EPA 8081 A	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 A	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA	EPA 8081 A	HEPTACHLOR	PA
EPA 8081 A	HEPTACHLOR EPOXIDE	PA	EPA 8081 A	METHOXYCHLOR	PA
EPA 8081 A	TOXAPHENE (CHLORINATED CAMPHENE)	PA	EPA 8081 B	4,4'-DDD	PA
EPA 8081 B	4,4'-DDE	PA	EPA 8081 B	4,4'-DDT	PA
EPA 8081 B	ALDRIN	PA	EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA	EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	CHLORDANE (TECH.)	PA	EPA 8081 B	DELTA-BHC	PA
EPA 8081 B	DIELDRIN	PA	EPA 8081 B	ENDOSULFAN I	PA
EPA 8081 B	ENDOSULFAN II	PA	EPA 8081 B	ENDOSULFAN SULFATE	PA
EPA 8081 B	ENDRIN	PA	EPA 8081 B	ENDRIN ALDEHYDE	PA
EPA 8081 B	ENDRIN KETONE	PA	EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA	EPA 8081 B	HEPTACHLOR	PA
EPA 8081 B	HEPTACHLOR EPOXIDE	PA	EPA 8081 B	METHOXYCHLOR	PA
EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	PA	EPA 8081 B - EXTENDED	KEPONE	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8081 B - EXTENDED	MIREX	PA	EPA 8082 - OIL A	AROCLOR-1016 (PCB-1016)	PA
EPA 8082 - OIL A	AROCLOR-1221 (PCB-1221)	PA	EPA 8082 - OIL A	AROCLOR-1232 (PCB-1232)	PA
EPA 8082 - OIL A	AROCLOR-1242 (PCB-1242)	PA	EPA 8082 - OIL A	AROCLOR-1248 (PCB-1248)	PA
EPA 8082 - OIL A	AROCLOR-1254 (PCB-1254)	PA	EPA 8082 - OIL A	AROCLOR-1260 (PCB-1260)	PA
EPA 8082 A	AROCLOR-1016 (PCB-1016)	PA	EPA 8082 A	AROCLOR-1221 (PCB-1221)	PA
EPA 8082 A	AROCLOR-1232 (PCB-1232)	PA	EPA 8082 A	AROCLOR-1242 (PCB-1242)	PA
EPA 8082 A	AROCLOR-1248 (PCB-1248)	PA	EPA 8082 A	AROCLOR-1254 (PCB-1254)	PA
EPA 8082 A	AROCLOR-1260 (PCB-1260)	PA	EPA 8082 A - EXTENDED	AROCLOR-1262 (PCB-1262)	PA
EPA 8082 A - EXTENDED	AROCLOR-1268 (PCB-1268)	PA	EPA 8141 A	ATRAZINE	PA
EPA 8141 A	BOLSTAR (SULPROFOS)	PA	EPA 8141 A	CHLORPYRIFOS	PA
EPA 8141 A	COUMAPHOS	PA	EPA 8141 A	DEMETON-O	PA
EPA 8141 A	DEMETON-S	PA	EPA 8141 A	DIAZINON	PA
EPA 8141 A	DICHLOROVOS (DDVP, DICHLORVOS)	PA	EPA 8141 A	DISULFOTON	PA
EPA 8141 A	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA	EPA 8141 A	ETHION	PA
EPA 8141 A	ETHOPROP	PA	EPA 8141 A	FAMPHUR	PA
EPA 8141 A	FENSULFOTHION	PA	EPA 8141 A	FENTHION	PA
EPA 8141 A	MALATHION	PA	EPA 8141 A	MERPHOS	PA
EPA 8141 A	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8141 A	MEVINPHOS	PA
EPA 8141 A	NALED	PA	EPA 8141 A	PARATHION (PARATHION - ETHYL)	PA
EPA 8141 A	PHORATE	PA	EPA 8141 A	RONNEL	PA
EPA 8141 A	SIMAZINE	PA	EPA 8141 A	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA
EPA 8141 A	TOKUTHION (PROTHIOPHOS)	PA	EPA 8141 A	TRICHLORONATE	PA
EPA 8141 B	ATRAZINE	PA	EPA 8141 B	BOLSTAR (SULPROFOS)	PA
EPA 8141 B	COUMAPHOS	PA	EPA 8141 B	DEMETON-O	PA
EPA 8141 B	DEMETON-S	PA	EPA 8141 B	DIAZINON	PA
EPA 8141 B	DICHLOROVOS (DDVP, DICHLORVOS)	PA	EPA 8141 B	DISULFOTON	PA
EPA 8141 B	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA	EPA 8141 B	ETHION	PA
EPA 8141 B	ETHOPROP	PA	EPA 8141 B	FAMPHUR	PA
EPA 8141 B	FENSULFOTHION	PA	EPA 8141 B	FENTHION	PA
EPA 8141 B	MALATHION	PA	EPA 8141 B	MERPHOS	PA
EPA 8141 B	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8141 B	MEVINPHOS	PA

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LANCASTER, PA 17601

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8141 B	NALED	PA	EPA 8141 B	PARATHION (PARATHION - ETHYL)	PA
EPA 8141 B	PHORATE	PA	EPA 8141 B	RONNEL	PA
EPA 8141 B	SIMAZINE	PA	EPA 8141 B	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA
EPA 8141 B	TOKUTHION (PROTHIOPHOS)	PA	EPA 8141 B	TRICHLORONATE	PA
EPA 8151 A	2,4,5-T	PA	EPA 8151 A	2,4-D	PA
EPA 8151 A	2,4-DB	PA	EPA 8151 A	DALAPON	PA
EPA 8151 A	DICAMBA	PA	EPA 8151 A	DICHLOROPROP (DICHLORPROP)	PA
EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 8151 A	MCPA	PA
EPA 8151 A	MCPP	PA	EPA 8151 A	PENTACHLOROPHENOL	PA
EPA 8151 A	PICLORAM	PA	EPA 8151 A	SILVEX (2,4,5-TP)	PA
EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	PA	EPA 8260 B	1,1,1-TRICHLOROETHANE	PA
EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	PA	EPA 8260 B	1,1,2-TRICHLOROETHANE	PA
EPA 8260 B	1,1-DICHLOROETHANE	PA	EPA 8260 B	1,1-DICHLOROETHYLENE	PA
EPA 8260 B	1,1-DICHLOROPROPENE	PA	EPA 8260 B	1,2,3-TRICHLOROBENZENE	PA
EPA 8260 B	1,2,3-TRICHLOROPROPANE	PA	EPA 8260 B	1,2,4-TRICHLOROBENZENE	PA
EPA 8260 B	1,2,4-TRIMETHYLBENZENE	PA	EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 8260 B	1,2-DICHLOROBENZENE	PA
EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA	EPA 8260 B	1,2-DICHLOROPROPANE	PA
EPA 8260 B	1,3,5-TRIMETHYLBENZENE	PA	EPA 8260 B	1,3-DICHLOROBENZENE	PA
EPA 8260 B	1,3-DICHLOROPROPANE	PA	EPA 8260 B	1,4-DICHLOROBENZENE	PA
EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA	EPA 8260 B	1-BUTANOL (N-BUTANOL)	PA
EPA 8260 B	2,2-DICHLOROPROPANE	PA	EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA
EPA 8260 B	2-CHLOROETHYL VINYL ETHER	PA	EPA 8260 B	2-CHLOROTOLUENE	PA
EPA 8260 B	2-HEXANONE	PA	EPA 8260 B	4-CHLOROTOLUENE	PA
EPA 8260 B	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 B	ACETONE	PA	EPA 8260 B	ACETONITRILE	PA
EPA 8260 B	ACROLEIN (PROPENAL)	PA	EPA 8260 B	ACRYLONITRILE	PA
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 B	BENZENE	PA
EPA 8260 B	BENZYL CHLORIDE	PA	EPA 8260 B	BROMOBENZENE	PA
EPA 8260 B	BROMOCHLOROMETHANE	PA	EPA 8260 B	BROMODICHLOROMETHANE	PA
EPA 8260 B	BROMOFORM	PA	EPA 8260 B	CARBON DISULFIDE	PA
EPA 8260 B	CARBON TETRACHLORIDE	PA	EPA 8260 B	CHLOROBENZENE	PA

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 B	CHLORODIBROMOMETHANE	PA	EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 B	CHLOROFORM	PA	EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 B	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	PA	EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	PA
EPA 8260 B	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA	EPA 8260 B	ETHANOL	PA
EPA 8260 B	ETHYL ACETATE	PA	EPA 8260 B	ETHYL METHACRYLATE	PA
EPA 8260 B	ETHYLBENZENE	PA	EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8260 B	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 B	ISOPROPYLBENZENE	PA
EPA 8260 B	M+P-XYLENE	PA	EPA 8260 B	METHACRYLONITRILE	PA
EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	PA	EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	PA
EPA 8260 B	METHYL METHACRYLATE	PA	EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	PA
EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 B	N-BUTYLBENZENE	PA
EPA 8260 B	N-PROPYLBENZENE	PA	EPA 8260 B	NAPHTHALENE	PA
EPA 8260 B	O-XYLENE	PA	EPA 8260 B	PENTACHLOROETHANE	PA
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	PA	EPA 8260 B	SEC-BUTYLBENZENE	PA
EPA 8260 B	STYRENE	PA	EPA 8260 B	TERT-BUTYL ALCOHOL	PA
EPA 8260 B	TERT-BUTYLBENZENE	PA	EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 8260 B	TOLUENE	PA	EPA 8260 B	TRANS-1,2-DICHLOROETHENE	PA
EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	PA	EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	PA
EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 8260 B	VINYL ACETATE	PA	EPA 8260 B	VINYL CHLORIDE	PA
EPA 8260 B	XYLENE (TOTAL)	PA	EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	PA
EPA 8260 B - EXTENDED	CYCLOHEXANE	PA	EPA 8260 B - EXTENDED	CYCLOHEXANONE	PA
EPA 8260 B - EXTENDED	DI-ISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA	EPA 8260 B - EXTENDED	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8260 B - EXTENDED	METHYL ACETATE	PA
EPA 8260 B - EXTENDED	METHYLCYCLOHEXANE	PA	EPA 8260 B - EXTENDED	T-AMYL ALCOHOL (TAA)	PA

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EPA 8260 B - EXTENDED	T-AMYLMETHYLETHER (TAME)	PA	EPA 8260 B - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8260 C	1,1,1,2-TETRACHLOROETHANE	PA	EPA 8260 C	1,1,1-TRICHLOROETHANE	PA
EPA 8260 C	1,1,2,2-TETRACHLOROETHANE	PA	EPA 8260 C	1,1,2-TRICHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROETHANE	PA	EPA 8260 C	1,1-DICHLOROETHYLENE	PA
EPA 8260 C	1,1-DICHLOROPROPENE	PA	EPA 8260 C	1,2,3-TRICHLOROBENZENE	PA
EPA 8260 C	1,2,3-TRICHLOROPROPANE	PA	EPA 8260 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8260 C	1,2,4-TRIMETHYLBENZENE	PA	EPA 8260 C	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 8260 C	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 8260 C	1,2-DICHLOROBENZENE	PA
EPA 8260 C	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA	EPA 8260 C	1,2-DICHLOROPROPANE	PA
EPA 8260 C	1,3,5-TRIMETHYLBENZENE	PA	EPA 8260 C	1,3-DICHLOROBENZENE	PA
EPA 8260 C	1,3-DICHLOROPROPANE	PA	EPA 8260 C	1,4-DICHLOROBENZENE	PA
EPA 8260 C	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA	EPA 8260 C	2,2-DICHLOROPROPANE	PA
EPA 8260 C	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 C	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 C	2-CHLOROTOLUENE	PA	EPA 8260 C	2-HEXANONE	PA
EPA 8260 C	4-CHLOROTOLUENE	PA	EPA 8260 C	4-ISOPROPYLTOLUENE (P-CYMENE)	PA
EPA 8260 C	4-METHYL-2-PENTANONE (MIBK)	PA	EPA 8260 C	ACETONE	PA
EPA 8260 C	ACETONITRILE	PA	EPA 8260 C	ACROLEIN (PROPENAL)	PA
EPA 8260 C	ACRYLONITRILE	PA	EPA 8260 C	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA
EPA 8260 C	BENZENE	PA	EPA 8260 C	BENZYL CHLORIDE	PA
EPA 8260 C	BROMOBENZENE	PA	EPA 8260 C	BROMOCHLOROMETHANE	PA
EPA 8260 C	BROMODICHLOROMETHANE	PA	EPA 8260 C	BROMOFORM	PA
EPA 8260 C	CARBON DISULFIDE	PA	EPA 8260 C	CARBON TETRACHLORIDE	PA
EPA 8260 C	CHLOROBENZENE	PA	EPA 8260 C	CHLORODIBROMOMETHANE	PA
EPA 8260 C	CHLOROETHANE (ETHYL CHLORIDE)	PA	EPA 8260 C	CHLOROFORM	PA
EPA 8260 C	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA	EPA 8260 C	CIS-1,2-DICHLOROETHYLENE	PA
EPA 8260 C	CIS-1,3-DICHLOROPROPENE	PA	EPA 8260 C	CYCLOHEXANE	PA
EPA 8260 C	DIBROMOMETHANE (METHYLENE BROMIDE)	PA	EPA 8260 C	DICHLORODIFLUOROMETHANE (FREON-12)	PA
EPA 8260 C	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA	EPA 8260 C	ETHANOL	PA
EPA 8260 C	ETHYL ACETATE	PA	EPA 8260 C	ETHYL METHACRYLATE	PA
EPA 8260 C	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA	EPA 8260 C	ETHYLBENZENE	PA
EPA 8260 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8260 C	HEXACHLOROETHANE	PA

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 C	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 C	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 C	ISOPROPYLBENZENE	PA
EPA 8260 C	METHACRYLONITRILE	PA	EPA 8260 C	METHYL BROMIDE (BROMOMETHANE)	PA
EPA 8260 C	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 8260 C	METHYL METHACRYLATE	PA
EPA 8260 C	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8260 C	METHYLCYCLOHEXANE	PA
EPA 8260 C	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 C	N-BUTYLBENZENE	PA
EPA 8260 C	N-PROPYLBENZENE	PA	EPA 8260 C	NAPHTHALENE	PA
EPA 8260 C	PENTACHLOROETHANE	PA	EPA 8260 C	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 C	SEC-BUTYLBENZENE	PA	EPA 8260 C	STYRENE	PA
EPA 8260 C	T-AMYLMETHYLETHER (TAME)	PA	EPA 8260 C	TERT-BUTYL ALCOHOL	PA
EPA 8260 C	TETRACHLOROETHENE (PERCHLOROETHENE)	PA	EPA 8260 C	TOLUENE	PA
EPA 8260 C	TRANS-1,2-DICHLOROETHENE	PA	EPA 8260 C	TRANS-1,3-DICHLOROPROPENE	PA
EPA 8260 C	TRANS-1,4-DICHLORO-2-BUTENE	PA	EPA 8260 C	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA
EPA 8260 C	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA	EPA 8260 C	VINYL ACETATE	PA
EPA 8260 C	VINYL CHLORIDE	PA	EPA 8260 C	XYLENE (TOTAL)	PA
EPA 8260 C - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUOR OETHANE (FREON 113)	PA	EPA 8260 C - EXTENDED	DI-ISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 8260 C - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8260 C - EXTENDED	METHYL ACETATE	PA
EPA 8260 C - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 C - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8270 C	1,2,4,5-TETRACHLOROBENZENE	PA	EPA 8270 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8270 C	1,2-DICHLOROBENZENE	PA	EPA 8270 C	1,2-DINITROBENZENE	PA
EPA 8270 C	1,2-DIPHENYLHYDRAZINE	PA	EPA 8270 C	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA
EPA 8270 C	1,3-DICHLOROBENZENE	PA	EPA 8270 C	1,3-DINITROBENZENE (1,3-DNB)	PA
EPA 8270 C	1,4-DICHLOROBENZENE	PA	EPA 8270 C	1,4-DINITROBENZENE	PA
EPA 8270 C	1,4-NAPHTHOQUINONE	PA	EPA 8270 C	1,4-PHENYLENEDIAMINE	PA
EPA 8270 C	1-CHLORONAPHTHALENE	PA	EPA 8270 C	1-NAPHTHYLAMINE	PA
EPA 8270 C	2,3,4,6-TETRACHLOROPHENOL	PA	EPA 8270 C	2,4,5-TRICHLOROPHENOL	PA
EPA 8270 C	2,4,6-TRICHLOROPHENOL	PA	EPA 8270 C	2,4-DICHLOROPHENOL	PA
EPA 8270 C	2,4-DIMETHYLPHENOL	PA	EPA 8270 C	2,4-DINITROPHENOL	PA
EPA 8270 C	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8270 C	2,6-DICHLOROPHENOL	PA
EPA 8270 C	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 8270 C	2-ACETYLAMINOFLUORENE	PA
EPA 8270 C	2-CHLORONAPHTHALENE	PA	EPA 8270 C	2-CHLOROPHENOL	PA

Scope of Accreditation

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EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA	EPA 8270 C	2-METHYLNAPHTHALENE	PA
EPA 8270 C	2-METHYLPHENOL (O-CRESOL)	PA	EPA 8270 C	2-NAPHTHYLAMINE	PA
EPA 8270 C	2-NITROANILINE	PA	EPA 8270 C	2-NITROPHENOL	PA
EPA 8270 C	2-PICOLINE (2-METHYLPYRIDINE)	PA	EPA 8270 C	3,3'-DICHLOROBENZIDINE	PA
EPA 8270 C	3,3'-DIMETHOXYBENZIDINE	PA	EPA 8270 C	3,3'-DIMETHYLBENZIDINE	PA
EPA 8270 C	3-METHYLCHOLANTHRENE	PA	EPA 8270 C	3-METHYLPHENOL (M-CRESOL)	PA
EPA 8270 C	3-NITROANILINE	PA	EPA 8270 C	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA
EPA 8270 C	4-AMINOBIPHENYL	PA	EPA 8270 C	4-BROMOPHENYL PHENYL ETHER	PA
EPA 8270 C	4-CHLORO-3-METHYLPHENOL	PA	EPA 8270 C	4-CHLOROANILINE	PA
EPA 8270 C	4-CHLOROPHENYL PHENYLETHER	PA	EPA 8270 C	4-DIMETHYL AMINOAZOBENZENE	PA
EPA 8270 C	4-METHYLPHENOL (P-CRESOL)	PA	EPA 8270 C	4-NITROANILINE	PA
EPA 8270 C	4-NITROPHENOL	PA	EPA 8270 C	5-NITRO-O-TOLUIDINE	PA
EPA 8270 C	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA	EPA 8270 C	A-A-DIMETHYLPHENETHYLAMINE	PA
EPA 8270 C	ACENAPHTHENE	PA	EPA 8270 C	ACENAPHTHYLENE	PA
EPA 8270 C	ACETOPHENONE	PA	EPA 8270 C	ANILINE	PA
EPA 8270 C	ANTHRACENE	PA	EPA 8270 C	ARAMITE	PA
EPA 8270 C	BENZIDINE	PA	EPA 8270 C	BENZO(A)ANTHRACENE	PA
EPA 8270 C	BENZO(A)PYRENE	PA	EPA 8270 C	BENZO(G,H,I)PERYLENE	PA
EPA 8270 C	BENZO(K)FLUORANTHENE	PA	EPA 8270 C	BENZOIC ACID	PA
EPA 8270 C	BENZO[B]FLUORANTHENE	PA	EPA 8270 C	BENZYL ALCOHOL	PA
EPA 8270 C	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 8270 C	BIS(2-CHLOROETHYL) ETHER	PA
EPA 8270 C	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 8270 C	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 8270 C	BUTYL BENZYL PHTHALATE	PA	EPA 8270 C	CHLOROBENZILATE	PA
EPA 8270 C	CHRYSENE	PA	EPA 8270 C	DI-N-BUTYL PHTHALATE	PA
EPA 8270 C	DI-N-OCTYL PHTHALATE	PA	EPA 8270 C	DIALLATE	PA
EPA 8270 C	DIBENZ(A, J) ACRIDINE	PA	EPA 8270 C	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 C	DIBENZOFURAN	PA	EPA 8270 C	DIETHYL PHTHALATE	PA
EPA 8270 C	DIMETHOATE	PA	EPA 8270 C	DIMETHYL PHTHALATE	PA
EPA 8270 C	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 8270 C	DIPHENYLAMINE	PA
EPA 8270 C	DISULFOTON	PA	EPA 8270 C	ETHYL METHANESULFONATE	PA
EPA 8270 C	FAMPHUR	PA	EPA 8270 C	FLUORANTHENE	PA
EPA 8270 C	FLUORENE	PA	EPA 8270 C	HEXACHLOROBENZENE	PA
EPA 8270 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 C	HEXACHLOROCYCLOPENTADIENE	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	HEXACHLOROETHANE	PA	EPA 8270 C	HEXACHLOROPROPENE	PA
EPA 8270 C	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C	ISODRIN	PA
EPA 8270 C	ISOPHORONE	PA	EPA 8270 C	ISOSAFROLE	PA
EPA 8270 C	KEPONE	PA	EPA 8270 C	METHAPYRILENE	PA
EPA 8270 C	METHYL METHANESULFONATE	PA	EPA 8270 C	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 C	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 C	N-NITROSODI-N-PROPYLAMINE	PA
EPA 8270 C	N-NITROSODIETHYLAMINE	PA	EPA 8270 C	N-NITROSODIMETHYLAMINE	PA
EPA 8270 C	N-NITROSODIPHENYLAMINE	PA	EPA 8270 C	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 C	N-NITROSOMORPHOLINE	PA	EPA 8270 C	N-NITROSOPIPERIDINE	PA
EPA 8270 C	N-NITROSOPYRROLIDINE	PA	EPA 8270 C	NAPHTHALENE	PA
EPA 8270 C	NITROBENZENE	PA	EPA 8270 C	NITROQUINOLINE-1-OXIDE	PA
EPA 8270 C	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA	EPA 8270 C	O-TOLUIDINE (2-METHYLANILINE)	PA
EPA 8270 C	PARATHION (PARATHION - ETHYL)	PA	EPA 8270 C	PENTACHLOROBENZENE	PA
EPA 8270 C	PENTACHLORONITROBENZENE	PA	EPA 8270 C	PENTACHLOROPHENOL	PA
EPA 8270 C	PHENACETIN	PA	EPA 8270 C	PHENANTHRENE	PA
EPA 8270 C	PHENOL	PA	EPA 8270 C	PHORATE	PA
EPA 8270 C	PHTHALIC ANHYDRIDE	PA	EPA 8270 C	PRONAMIDE (KERB)	PA
EPA 8270 C	PYRENE	PA	EPA 8270 C	PYRIDINE	PA
EPA 8270 C	SAFROLE	PA	EPA 8270 C	THIONAZIN (ZINOPHOS)	PA
EPA 8270 C	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA	EPA 8270 C SIM	2-METHYLNAPHTHALENE	PA
EPA 8270 C SIM	ACENAPHTHENE	PA	EPA 8270 C SIM	ACENAPHTHYLENE	PA
EPA 8270 C SIM	ANTHRACENE	PA	EPA 8270 C SIM	BENZO(A)ANTHRACENE	PA
EPA 8270 C SIM	BENZO(A)PYRENE	PA	EPA 8270 C SIM	BENZO(G,H,I)PERYLENE	PA
EPA 8270 C SIM	BENZO(K)FLUORANTHENE	PA	EPA 8270 C SIM	BENZO[B]FLUORANTHENE	PA
EPA 8270 C SIM	CHRYSENE	PA	EPA 8270 C SIM	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 C SIM	FLUORANTHENE	PA	EPA 8270 C SIM	FLUORENE	PA
EPA 8270 C SIM	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C SIM	NAPHTHALENE	PA
EPA 8270 C SIM	PHENANTHRENE	PA	EPA 8270 C SIM	PYRENE	PA
EPA 8270 C SIM - EXTENDED	1-METHYLNAPHTHALENE	PA	EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	PA
EPA 8270 D	1,2,4-TRICHLOROBENZENE	PA	EPA 8270 D	1,2-DICHLOROBENZENE	PA
EPA 8270 D	1,2-DINITROBENZENE	PA	EPA 8270 D	1,2-DIPHENYLHYDRAZINE	PA
EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8270 D	1,3-DICHLOROBENZENE	PA
EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8270 D	1,4-DICHLOROBENZENE	PA
EPA 8270 D	1,4-DINITROBENZENE	PA	EPA 8270 D	1,4-NAPHTHOQUINONE	PA
EPA 8270 D	1,4-PHENYLENEDIAMINE	PA	EPA 8270 D	1-CHLORONAPHTHALENE	PA
EPA 8270 D	1-NAPHTHYLAMINE	PA	EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	PA

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	2,4,5-TRICHLOROPHENOL	PA	EPA 8270 D	2,4,6-TRICHLOROPHENOL	PA
EPA 8270 D	2,4-DICHLOROPHENOL	PA	EPA 8270 D	2,4-DIMETHYLPHENOL	PA
EPA 8270 D	2,4-DINITROPHENOL	PA	EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8270 D	2,6-DICHLOROPHENOL	PA	EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8270 D	2-ACETYLAMINOFLUORENE	PA	EPA 8270 D	2-CHLORONAPHTHALENE	PA
EPA 8270 D	2-CHLOROPHENOL	PA	EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 8270 D	2-METHYLNAPHTHALENE	PA	EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	PA
EPA 8270 D	2-NAPHTHYLAMINE	PA	EPA 8270 D	2-NITROANILINE	PA
EPA 8270 D	2-NITROPHENOL	PA	EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	PA
EPA 8270 D	3,3'-DICHLOROBENZIDINE	PA	EPA 8270 D	3,3'-DIMETHOXYBENZIDINE	PA
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	PA	EPA 8270 D	3-METHYLCHOLANTHRENE	PA
EPA 8270 D	3-METHYLPHENOL (M-CRESOL)	PA	EPA 8270 D	3-NITROANILINE	PA
EPA 8270 D	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA	EPA 8270 D	4-AMINOBIPHENYL	PA
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	PA	EPA 8270 D	4-CHLORO-3-METHYLPHENOL	PA
EPA 8270 D	4-CHLOROANILINE	PA	EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	PA
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	PA	EPA 8270 D	4-METHYLPHENOL (P-CRESOL)	PA
EPA 8270 D	4-NITROANILINE	PA	EPA 8270 D	4-NITROPHENOL	PA
EPA 8270 D	5-NITRO-O-TOLUIDINE	PA	EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA
EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	PA	EPA 8270 D	ACENAPHTHENE	PA
EPA 8270 D	ACENAPHTHYLENE	PA	EPA 8270 D	ACETOPHENONE	PA
EPA 8270 D	ANILINE	PA	EPA 8270 D	ANTHRACENE	PA
EPA 8270 D	ARAMITE	PA	EPA 8270 D	BENZIDINE	PA
EPA 8270 D	BENZO(A)ANTHRACENE	PA	EPA 8270 D	BENZO(A)PYRENE	PA
EPA 8270 D	BENZO(G,H,I)PERYLENE	PA	EPA 8270 D	BENZO(K)FLUORANTHENE	PA
EPA 8270 D	BENZOIC ACID	PA	EPA 8270 D	BENZO[B]FLUORANTHENE	PA
EPA 8270 D	BENZYL ALCOHOL	PA	EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	PA
EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	PA	EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	PA
EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA	EPA 8270 D	BUTYL BENZYL PHTHALATE	PA
EPA 8270 D	CHLOROBENZILATE	PA	EPA 8270 D	CHRYSENE	PA
EPA 8270 D	DI-N-BUTYL PHTHALATE	PA	EPA 8270 D	DI-N-OCTYL PHTHALATE	PA
EPA 8270 D	DIALLATE	PA	EPA 8270 D	DIBENZ(A, J) ACRIDINE	PA
EPA 8270 D	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 D	DIBENZOFURAN	PA
EPA 8270 D	DIETHYL PHTHALATE	PA	EPA 8270 D	DIMETHOATE	PA
EPA 8270 D	DIMETHYL PHTHALATE	PA			

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 8270 D	DIPHENYLAMINE	PA
EPA 8270 D	DISULFOTON	PA	EPA 8270 D	ETHYL METHANESULFONATE	PA
EPA 8270 D	FAMPHUR	PA	EPA 8270 D	FLUORANTHENE	PA
EPA 8270 D	FLUORENE	PA	EPA 8270 D	HEXACHLOROBENZENE	PA
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	PA
EPA 8270 D	HEXACHLOROETHANE	PA	EPA 8270 D	HEXACHLOROPROPENE	PA
EPA 8270 D	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 D	ISODRIN	PA
EPA 8270 D	ISOPHORONE	PA	EPA 8270 D	ISOSAFROLE	PA
EPA 8270 D	KEPONE	PA	EPA 8270 D	METHAPYRILENE	PA
EPA 8270 D	METHYL METHANESULFONATE	PA	EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	PA
EPA 8270 D	N-NITROSODIETHYLAMINE	PA	EPA 8270 D	N-NITROSODIMETHYLAMINE	PA
EPA 8270 D	N-NITROSODIPHENYLAMINE	PA	EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 D	N-NITROSOMORPHOLINE	PA	EPA 8270 D	N-NITROSOPIPERIDINE	PA
EPA 8270 D	N-NITROSOPYRROLIDINE	PA	EPA 8270 D	NAPHTHALENE	PA
EPA 8270 D	NITROBENZENE	PA	EPA 8270 D	NITROQUINOLINE-1-OXIDE	PA
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA	EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	PA
EPA 8270 D	PARATHION (PARATHION - ETHYL)	PA	EPA 8270 D	PENTACHLOROBENZENE	PA
EPA 8270 D	PENTACHLORONITROBENZENE	PA	EPA 8270 D	PENTACHLOROPHENOL	PA
EPA 8270 D	PHENACETIN	PA	EPA 8270 D	PHENANTHRENE	PA
EPA 8270 D	PHENOL	PA	EPA 8270 D	PHORATE	PA
EPA 8270 D	PHTHALIC ANHYDRIDE	PA	EPA 8270 D	PRONAMIDE (KERB)	PA
EPA 8270 D	PYRENE	PA	EPA 8270 D	SAFROLE	PA
EPA 8270 D	THIONAZIN (ZINOPHOS)	PA	EPA 8270 D	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA
EPA 8270 D - EXTENDED	1,1-BIPHENYL	PA	EPA 8270 D - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8270 D - EXTENDED	ATRAZINE	PA	EPA 8270 D - EXTENDED	BENZALDEHYDE	PA
EPA 8270 D - EXTENDED	BIS(2-ETHYLHEXYL)ADIPATE (DI(2-ETHYLHEXYL)ADIPATE)	PA	EPA 8270 D - EXTENDED	CAPROLACTAM	PA
EPA 8270 D - EXTENDED	CARBAZOLE	PA	EPA 8270 D - EXTENDED	PYRIDINE	PA
EPA 8270 D SIM	2-METHYLNAPHTHALENE	PA	EPA 8270 D SIM	ACENAPHTHENE	PA
EPA 8270 D SIM	ACENAPHTHYLENE	PA	EPA 8270 D SIM	ANTHRACENE	PA
EPA 8270 D SIM	BENZO(A)ANTHRACENE	PA	EPA 8270 D SIM	BENZO(A)PYRENE	PA
EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	PA	EPA 8270 D SIM	BENZO(K)FLUORANTHENE	PA
EPA 8270 D SIM	BENZO[B]FLUORANTHENE	PA	EPA 8270 D SIM	CHRYSENE	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 D SIM	FLUORANTHENE	PA
EPA 8270 D SIM	FLUORENE	PA	EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 D SIM	NAPHTHALENE	PA	EPA 8270 D SIM	PHENANTHRENE	PA
EPA 8270 D SIM	PYRENE	PA	EPA 8270 D SIM - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA
EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA
EPA 8290 A	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA	EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA
EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (1,2,3,7,8,9-HXCDF)	PA	EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (1,2,3,7,8-PECDD)	PA
EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZOFURAN (1,2,3,7,8-PECDF)	PA	EPA 8290 A	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (2,3,4,6,7,8-HXCDF)	PA
EPA 8290 A	2,3,4,7,8-PENTACHLORODIBENZOFURAN	PA	EPA 8290 A	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA
EPA 8290 A	2,3,7,8-TETRACHLORODIBENZOFURAN (2,3,7,8-TCDF)	PA	EPA 8315 A	2,5-DIMETHYLBENZALDEHYDE	PA
EPA 8315 A	ACETALDEHYDE	PA	EPA 8315 A	ACROLEIN (PROPENAL)	PA
EPA 8315 A	BENZALDEHYDE	PA	EPA 8315 A	BUTYLALDEHYDE (BUTANAL)	PA
EPA 8315 A	CROTONALDEHYDE	PA	EPA 8315 A	FORMALDEHYDE	PA
EPA 8315 A	HEXANALDEHYDE (HEXANAL)	PA	EPA 8315 A	ISOVALERALDEHYDE	PA
EPA 8315 A	M-TOLUALDEHYDE (1,3-TOLUALDEHYDE)	PA	EPA 8315 A	O-TOLUALDEHYDE (1,2-TOLUALDEHYDE)	PA
EPA 8315 A	P-TOLUALDEHYDE (1,4-TOLUALDEHYDE)	PA	EPA 8315 A	PENTANAL (VALERALDEHYDE)	PA
EPA 8315 A	PROPIONALDEHYDE (PROPANAL)	PA	EPA 8330	NITROGLYCERIN	PA
EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	PA
EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	PA	EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	PA
EPA 8330 A	2-NITROTOLUENE	PA	EPA 8330 A	3-NITROTOLUENE	PA
EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	PA	EPA 8330 A	4-NITROTOLUENE	PA
EPA 8330 A	METHYL-2,4,6-TRINITROPHENYLNITRAMINE (TETRYL)	PA	EPA 8330 A	NITROBENZENE	PA
EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	PA	EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	PA
EPA 9012 A	CYANIDE	PA	EPA 9040 B	PH	PA
EPA 9045 C	PH	PA			

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 2914

EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC
2425 NEW HOLLAND PIKE
LANCASTER, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2014
Expiration Date: June 14, 2015

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 9045 D	PH	PA	EPA 9050 A	CONDUCTIVITY	PA
EPA 9060	TOTAL ORGANIC CARBON	PA	EPA 9066	TOTAL PHENOLICS	PA
EPA 9071 B	OIL AND GREASE (AS HEM)	PA	EPA 9081	CATION EXCHANGE CAPACITY	PA
EPA 9095 B	FREE LIQUID	PA			

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Type I Data Package

Abridged data package. Full deliverable available.

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

Project: RAAP - Radford, VA - HWMU-5
Groundwater and Water Samples
Collected on 10/19/15-10/20/15

SDG# RAE50

GROUP	SAMPLE NUMBERS
1603144	8100942-8100953

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date:** **11/17/2015**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Barbara Weyandt at (717) 556-7264.

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Sample Reference List for SDG Number RAE50
with a Data Package Type of I

11200 - Draper Aden Associates, Inc.

Project: RAAP - Radford, VA - HWMU-5

Lab Sample Number	Lab Sample Code	Client Sample Description
8100942	5W8-B	5W8B Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100943	5W5B-	5W5B Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100944	5W7B-	5W7B Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100945	5W7B-	5W7B Matrix Spike Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100946	5W7B-	5W7B Matrix Spike Dup Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100947	5WC21	5WC21 Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100948	5W-FD	5WDUP Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100949	5WC22	5WC22 Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100950	5WC23	5WC23 Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100951	5W12A	5W12A Grab Groundwater 2015-2nd Semiannual Groundwater Corrective Action
8100952	5WTB1	Trip Blank 1 Water 2015-2nd Semiannual Groundwater Corrective Action
8100953	5WTB2	Trip Blank 2 Water 2015-2nd Semiannual Groundwater Corrective Action

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Sample pH Log

SDG: RAE50

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #
8100942	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100943	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100944	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100945	038B	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100946	038B	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100947	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100948	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100949	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100950	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100951	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100952	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8100953	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

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01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030C, May 2003.

11996 VOCs- 25ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

November 12, 2015

Project: RAAP - Radford, VA - HWMU-5

Submittal Date: 10/22/2015
Group Number: 1603144
SDG: RAE50
State of Sample Origin: VA

Client Sample Description	Lancaster Labs (LL) #
5W8B Grab Groundwater	8100942
5W5B Grab Groundwater	8100943
5W7B Grab Groundwater	8100944
5W7B Matrix Spike Grab Groundwater	8100945
5W7B Matrix Spike Dup Grab Groundwater	8100946
5WC21 Grab Groundwater	8100947
5WDUP Grab Groundwater	8100948
5WC22 Grab Groundwater	8100949
5WC23 Grab Groundwater	8100950
5W12A Grab Groundwater	8100951
Trip Blank 1 Water	8100952
Trip Blank 2 Water	8100953

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Kathy Olsen
ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Janet Frazier

Respectfully Submitted,

Barbara Weyandt

Barbara A. Weyandt
Specialist

(717) 556-7264

Project Name: RAAP - Radford, VA - HWMU-5
LL Group #: 1603144

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: H153032AA (Sample number(s): 8100942-8100944, 8100947-8100953 UNSPK: 8100944)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Vinyl Chloride

Batch #: H153032AB (Sample number(s): 8100945-8100946 UNSPK: P100944)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Vinyl Chloride

Sample Description: 5W8B Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100942
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 10:05 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W8-B SDG#: RAE50-01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 00:42	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 00:42	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W5B Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100943
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 12:55 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W5B- SDG#: RAE50-02

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 01:03	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 01:03	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100944
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 12:05 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W7B- SDG#: RAE50-03BKG

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/30/2015 23:16	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/30/2015 23:16	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Matrix Spike Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100945
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 12:05 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W7B- SDG#: RAE50-03MS

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	4.4	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	4.6	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	4.5	0.8	1.0	1
11996	Trichloroethene	79-01-6	4.9	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	6.1	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AB	11/01/2015 13:56	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AB	11/01/2015 13:56	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W7B Matrix Spike Dup Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100946
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 12:05 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W7B- SDG#: RAE50-03MSD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	5.3	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	4.7	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	5.5	0.8	1.0	1
11996	Trichloroethene	79-01-6	5.0	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	6.2	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AB	11/01/2015 14:17	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AB	11/01/2015 14:17	Kerri E Legerlotz	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC21 Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100947
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/20/2015 11:20 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5WC21 SDG#: RAE50-04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	2.9	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 01:25	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 01:25	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WDUP Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100948
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/20/2015 11:25 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W-FD SDG#: RAE50-05FD

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	3.4	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 01:46	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 01:46	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC22 Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100949
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 13:50 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5WC22 SDG#: RAE50-06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	3.3	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 02:08	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 02:08	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5WC23 Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100950
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 14:35 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5WC23 SDG#: RAE50-07

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	4.4	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 02:29	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 02:29	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: 5W12A Grab Groundwater
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100951
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015 11:10 by KC

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5W12A SDG#: RAE50-08

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	ug/l	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/31/2015 02:51	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/31/2015 02:51	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank 1 Water
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100952
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5WTB1 SDG#: RAE50-09TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/30/2015 22:33	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/30/2015 22:33	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank 2 Water
2015-2nd Semiannual Groundwater Corrective Action
RAAP - Radford, VA - HWMU-5

LL Sample # WW 8100953
LL Group # 1603144
Account # 11200

Project Name: RAAP - Radford, VA - HWMU-5

Collected: 10/19/2015

Submitted: 10/22/2015 09:50
Reported: 11/12/2015 15:23

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

5WTB2 SDG#: RAE50-10TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	**ug/l**	
11996	1,1-Dichloroethene	75-35-4	N.D.	0.4	1.0	1
11996	cis-1,2-Dichloroethene	156-59-2	N.D.	0.1	1.0	1
11996	trans-1,2-Dichloroethene	156-60-5	N.D.	0.8	1.0	1
11996	Trichloroethene	79-01-6	N.D.	0.2	1.0	1
11996	Vinyl Chloride	75-01-4	N.D.	0.1	1.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	RAAP Unit 5 "J" list	SW-846 8260C	1	H153032AA	10/30/2015 22:55	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H153032AA	10/30/2015 22:55	Matthew S Krause	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1603144
Reported: 11/12/2015 15:23

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL**	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H153032AA	Sample number(s): 8100942-8100944,8100947-8100953								
1,1-Dichloroethene	N.D.	0.4	1.0	ug/l	89		80-120		
cis-1,2-Dichloroethene	N.D.	0.1	1.0	ug/l	96		80-120		
trans-1,2-Dichloroethene	N.D.	0.8	1.0	ug/l	94		80-120		
Trichloroethene	N.D.	0.2	1.0	ug/l	98		80-120		
Vinyl Chloride	N.D.	0.1	1.0	ug/l	120		71-123		
Batch number: H153032AB	Sample number(s): 8100945-8100946								
1,1-Dichloroethene	N.D.	0.4	1.0	ug/l	111		80-120		
cis-1,2-Dichloroethene	N.D.	0.1	1.0	ug/l	115		80-120		
trans-1,2-Dichloroethene	N.D.	0.8	1.0	ug/l	114		80-120		
Trichloroethene	N.D.	0.2	1.0	ug/l	97		80-120		
Vinyl Chloride	N.D.	0.1	1.0	ug/l	113		71-123		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: H153032AA	Sample number(s): 8100942-8100944,8100947-8100953 UNSPK: 8100944								
1,1-Dichloroethene	88	107	80-120	19	30				
cis-1,2-Dichloroethene	93	93	80-120	0	30				
trans-1,2-Dichloroethene	91	111	80-120	20	30				
Trichloroethene	98	100	80-120	3	30				
Vinyl Chloride	123	124*	71-123	1	30				
Batch number: H153032AB	Sample number(s): 8100945-8100946 UNSPK: 8100944								
1,1-Dichloroethene	88	107	80-120	19	30				
cis-1,2-Dichloroethene	93	93	80-120	0	30				
trans-1,2-Dichloroethene	91	111	80-120	20	30				
Trichloroethene	98	100	80-120	3	30				
Vinyl Chloride	123	124*	71-123	1	30				

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1603144
Reported: 11/12/2015 15:23

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: RAAP Unit 5 "J" list
Batch number: H153032AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8100942	102	111	95	92
8100943	102	111	94	92
8100944	104	109	95	92
8100947	92	101	90	87
8100948	102	108	94	91
8100949	102	110	95	92
8100950	102	107	96	92
8100951	101	106	94	92
8100952	100	110	95	92
8100953	102	109	94	92
Blank	101	112	100	92
LCS	100	111	95	93
MS	102	110	95	95
MSD	102	112	95	94
Limits:	77-114	74-113	77-110	78-110

Analysis Name: RAAP Unit 5 "J" list
Batch number: H153032AB

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8100945	102	110	95	95
8100946	102	112	95	94
Blank	102	111	94	94
LCS	110	111	95	97
MS	102	110	95	95
MSD	102	112	95	94
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

CHAIN OF CUSTODY RECORD

A-11200 G-1603144 S-8100947-53

AT 9/23/2015

Laboratory: Eurofins Lancaster Laboratories Environmental LLC, 2425 New Holland Pike, Lancaster, PA, 17605-2425/ Barb Weyandt, Manager

Client: Draper Aden Associates **Attn:** 0 **Address:** 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU5 **Event:** 2015 - 2nd Semiannual Groundwater Corrective Action Monitoring Event **DAA JN:** B03204-13A **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES UPS: 1Z 754 02X YO 4070 9830 **Carrier:** **Tracking Number:**		

Box 1: Matrix		**Box 2: Preservative**		**Box 3: Filtered/Unfiltered**	**Box 4: Sample Type**	**Invoice**
SW Surface Water	T Trip Blank	A HCL	E NaOH	F Filtered	G Grab	**Copy to Consultant:** YES
GW Groundwater	E Equipment Blank	B HNO_3	F ZnAc	U Unfiltered	C Composite	**Bill:** CLIENT OTHER
L Leachate	P Product	C H_2SO_4	G Other (Specify)	**Box 5: Sample Container Type**		**Preserved and shipped on ice:** YES
S Soil	O Other	D $Na_2S_2O_3$	H None	P Plastic V VOA AG Amber Glass CG Clear Glass		

Box 4 - Sample Type					G						
Box 3 - Filtered/Unfiltered					U						
Required pH of Sample					<2						
Box 2 - Preservative					A						
Box 5 - Sample Container Type					3-40ml V						
Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	8260C/5030C 25 ml purge Appendix J Analyte List						
5W8B	10/19	1005	GW	3	X						
5W5B	10/19	1255	GW	3	X						
5W7B	10/19	1205	GW	9 (3 MS/MSD)	X						
5WC21	10/20	1120	GW	3	X						
5WDUP	10/20	1125	GW	3	X						
5WC22	10/19	1350	GW	3	X						
5WC23	10/19	1435	GW	3	X						
5W12A	10/19	1110	GW	3	X						
Trip Blank 1	10/19	—	T	2	X						
Trip Blank 2	10/19	—	T	2	X						

GENERAL NOTES:

1. **See attached analyte list.**
2. **Report Results to MDL with "J" Flags.** 3. 1 trip blank per day of sampling.

Delete Trip blank 2 if not required.

USE FOR QC

Clients Special Instructions: level 1 with edd.

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival 2.6 °C Received on Ice ✓ Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 10/19/15	#1 Relinquished by (Signature):	Date: 10/21/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0700	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print): Will Mason-Deese	Date: 10/19/15	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date: 10.22.15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0700	Company Name:	Time:	Company Name: ELLE	Time: 950	

JVK 9/22/2015

1/2 AT 9/23/15

A-11200
G-1603144
S-8100742-53

ANALYTICAL METHOD: 8260C/5030C
TYPE METHOD: GCMS
CLASS: VOLATILE

Appendix – J Target Analyte List

No.	ANALYTE	CAS RN	Required QL (µg/l)	Required MDL*
1.	Trichloroethene	79-01-6	1	0.177
2.	1,1-Dichloroethene	75-35-4	1	0.44
3.	Cis-1,2-Dichloroethene	156-59-2	1	0.1
4.	Trans-1,2-Dichloroethene	156-60-5	1	0.8
5.	Vinyl Chloride	75-01-4	1	0.1

Note: *Report current lab MDL if higher.

25 ml purge volume

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 116537

Group Number(s): 1603144

Client: Draper Aden

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	10/22/2015 9:50
Number of Packages:	3	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	10
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 15:09 on 10/22/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.1	DT	Wet	Y	Bagged	N
2	DT131	2.0	DT	Wet	Y	Bagged	N
3	DT131	1.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Liberty Analytical

10/28/2015

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP UNIT 5/2014-2015 Co ONLY

WorkOrder: 1510132

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1510132

Project: RAAP UNIT 5/2014-2015 Co ONLY **Sdg:** 1510132

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1510132-01	5W7B	Water	10/19/2015 12:05	10/22/2015 09:17
1510132-02	5W8B	Water	10/19/2015 10:05	10/22/2015 09:17
1510132-03	5W5B	Water	10/19/2015 12:55	10/22/2015 09:17
1510132-04	5WC21	Water	10/20/2015 11:20	10/22/2015 09:17
1510132-05	5WDUP	Water	10/20/2015 11:25	10/22/2015 09:17
1510132-06	5WC22	Water	10/19/2015 13:50	10/22/2015 09:17
1510132-07	5WC23	Water	10/19/2015 14:35	10/22/2015 09:17
1510132-08	5W12A	Water	10/19/2015 11:10	10/22/2015 09:17

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP UNIT 5/2014-2015 Co ONLY

Laboratory: Liberty Analytical

SDG: 1510132

Client Sample Id:	Analysis:	Lab Sample Id:
5W7B	EPA 6020A	1510132-01
5W8B	EPA 6020A	1510132-02
5W5B	EPA 6020A	1510132-03
5WC21	EPA 6020A	1510132-04
5WDUP	EPA 6020A	1510132-05
5WC22	EPA 6020A	1510132-06
5WC23	EPA 6020A	1510132-07
5W12A	EPA 6020A	1510132-08

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 10/28/2015

Title: Chemist III

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

A. SDG Narrative

Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1510132
Client: DRAPER ADEN ASSOCIATES
Project: RAAP UNIT 5/2014-2015 Co ONLY

The indicated Sample Delivery Group (SDG) consisting of eight (8) water samples were received into the laboratory information management system (LIMS) on October 22, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The sample's temperature was 0.1 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A methodology for the requested metal cobalt.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Cobalt for sample 5W7B

$$\frac{2.24859\ \mu g/L\ (C) \times 0.05\ L\ (F)}{0.05\ L\ (I)} = 2.249\ \mu g/L \text{ reported as } 2.25\ J\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field sample was prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5102301-MS1 (5W7BS) was found to be inside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5102301-MSD1 (5W7BSD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5102301-DUP1 (5W7BD) was found to be inside control limits.

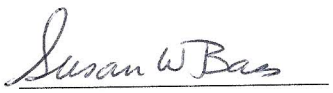
A five-fold serial dilution of sample, CCN = SDI1510132-01 (5W7BL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5102301-PS1 (5W7BA) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.



Susan W. Bass
Senior Chemist
October 28, 2015

Liberty Analytical

Liberty Analytical's Pagination Convention

As required by the EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is Liberty Analytical's policy to add an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.). This policy is also applicable to non-CLP data packages.

Revision 7 (01/12/2011)

Liberty Analytical

INORGANIC DATA REPORTING QUALIFIERS

On the appropriate reporting form, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. In the absence of specific qualifiers in the analytical method requested, the laboratory utilizes EPA CLP qualifiers. The qualifiers used are:

U : This flag indicates the compound was analyzed for, not detected and is reported as less than the Method Detection Limit (MDL) (or as defined by the client). The Reporting Limit (RL), or Limit of Quantitation (LOQ), and the MDL will be adjusted to reflect any dilution or concentration of the sample and, for soils, the percent moisture.

J : This flag indicates the reported result is an estimated value. The flag is used when an analyte is detected and the result is less than the adjusted RL/LOQ but equal to or greater than the MDL.

Q : This flag denotes that one or more quality control criteria have failed (e.g., LCS recovery, Continuing Calibration Verification, CCV, and interference check standards for ICP-AES/ICP-MS) and reanalyses can't be performed. The Q flag is applied to all specific analyte(s) in all samples associated with the failed quality control criteria.

B : This flag is used when the analyte is found in the associated method or calibration blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

D: This flag is applied to an analyte when the reported result is based on a dilution.

* This flag is applied to a target analyte when any QC acceptance criterion has not been met for that analyte. The flag appears on the reporting form of the associated QC analysis. The flag is applied if matrix spike recoveries are out of control limits and the sample result is ≤ 4X the spike added. The flag is also applied if duplicates are out of control. If both sample and duplicate values are ≥ 5X RL, then the RPD must be ≤ 20%. If either value (sample or duplicate) is < 5X RL, the absolute difference between the values has to be < CRQL to be in control. This flag is also applied to outliers in the serial dilution test. Any analytes with a sufficiently high concentration (minimally 10X RL after a 1:5 dilution) will have the flag applied if the dilution analysis doesn't agree within ± 10% of the original determination.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

The extensions: D, S, SD, L, and A are added to the end of the Client ID and represent the following:

D – Matrix Duplicate
S – Matrix Spike
SD – Matrix Spike Duplicate
L – Serial Dilution
A – Post Digestion Spike

Revision 3 (08-11-2015)

Chain of Custody Records

The laboratory shall include a copy of the Chain-of-Custody (CoC) documentation for all of the samples in the Work Order/SDG.

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

AT 9/23/2015

Client: Draper Aden Associates **Attn:** 0 **Address:** 0 0 0 **Phone:** **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RFAAP, Radford, Virginia **Location:** HWMU5 **Event:** 2015-2nd Semiannual Groundwater Corrective Action Monitoring Event **DAA JN:** B03204-13A **Lab JN:**	**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES UPS: 12.237.301-01-9188-0117 **Carrier:** **Tracking Number:**		

Box 1: Matrix		**Box 2: Preservative**		**Box 3: Filtered/Unfiltered**	**Box 4: Sample Type**	**Invoice**
SW Surface Water	T Trip Blank	A HCL	E NaOH	F Filtered	G Grab	**Copy to Consultant:** YES
GW Groundwater	E Equipment Blank	B HNO_3	F ZnAc	U Unfiltered	C Composite	**Bill:** CLIENT OTHER
L Leachate	P Product	C H_2SO_4	G Other (Specify)	**Box 5: Sample Container Type**		**Preserved and shipped on ice:** YES
S Soil	O Other	D $Na_2S_2O_3$	H None	P Plastic V VOA AG Amber Glass CG Clear Glass		

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample					<2								
Box 2 - Preservative					B								
Box 5 - Sample Container Type					1-500ml P								
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**Cobalt only-Total 6020A /3005A**	mtals pH							
5W8B	10/19	1005	GW	1	X	<2			1510132-02				
5W5B	10/19	1255	GW	1	X	<2				-03			
5W7B	10/19	1205	GW	3 (MS/MSD)	X	<2				-01			
5WC21	10/20	1120	GW	1	X	<2				-04			
5WDUP	10/20	1125	GW	1	X	<2				-05			
5WC22	10/19	1350	GW	1	X	<2				-06			
5WC23	10/19	1435	GW	1	X	<2				-07			
5W12A	10/19	1110	GW	1	X	<2				-08			

GENERAL NOTES:

1. Level 4 - report estimated results. 2. ERIS deivlerable required. 3. LOQ 5 ug/l, LOD 1 ug/l.

USE FOR QC

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival 0.1°C Received on Ice ✓ Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 10/19/15	#1 Relinquished by (Signature):	Date: 10/21/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0700	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print): Will Mason-Deese	Date: 10/19/15	#1 Received by (Signature):	Date: 10/22/15	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0700	Company Name: CompuChem/LIBERTY	Time: 0917	Company Name:	Time:	

JWK 9/23/2015

1/1 AT 9/23/15

1510132

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP UNIT 5/2014-2015 Co ONLY**	**Project Number:**	**RAAP UNIT 5/2014-2015 Co ONLY**
SDG:	**1510132** **CASE:**	**Status:**	**Prepared**

Report To:
DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone: (540) 552-0444
Fax: -

Invoice To:
DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone :(540) 552-0444
Fax: -

Date Due: 11/11/2015 00:00 (20 day TAT)

Received By: Cathy Dover — Date Received: 10/22/2015 09:17

Logged In By: Cathy Dover — Date Logged In: 10/22/2015 14:29

J & B Flags?: **YES**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **MDL**	Spike Level: **FULL Spike**		

1510132-01 FOR QC*6020A TOTAL Co ONLY*NEED LEVEL2 & LEVEL4 PDF REPORTS

Analysis	Due	TAT	Expires	Received	Comments
1510132-01 5W7B [Water] Sampled 10/19/2015 12:05 Eastern					**USE FOR QC**
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 12:05	10/22/2015 09:17	
1510132-02 5W8B [Water] Sampled 10/19/2015 10:05 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 10:05	10/22/2015 09:17	
1510132-03 5W5B [Water] Sampled 10/19/2015 12:55 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 12:55	10/22/2015 09:17	
1510132-04 5WC21 [Water] Sampled 10/20/2015 11:20 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/17/2016 11:20	10/22/2015 09:17	
1510132-05 5WDUP [Water] Sampled 10/20/2015 11:25 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/17/2016 11:25	10/22/2015 09:17	
1510132-06 5WC22 [Water] Sampled 10/19/2015 13:50 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 13:50	10/22/2015 09:17	
1510132-07 5WC23 [Water] Sampled 10/19/2015 14:35 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 14:35	10/22/2015 09:17	
1510132-08 5W12A [Water] Sampled 10/19/2015 11:10 Eastern					
6020A ICP MS (UPDATE IV)	11/11/2015 16:00	20	04/16/2016 11:10	10/22/2015 09:17	

1510132

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Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP UNIT 5/2014-2015 Co ONLY**	**Project Number:**	**RAAP UNIT 5/2014-2015 Co ONLY**
SDG:	**1510132** **CASE:**	**Status:**	**Prepared**

METHOD DETECTION AND REPORTING LIMITS

Laboratory: Liberty Analytical **SDG:** 1510132

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP UNIT 5/2014-2015 Co ONLY

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Cobalt	1	5.00	ug/L	EPA 6020A

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5102301-BS1 Matrix: Water Client ID: MLCSPQ Batch: 5102301

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	116	105		80 - 120

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W7BS

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5102301-MS1 % Solid: NA Matrix: Water Lab Source ID: 1510132-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	2.25 J	120	107		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

5W7BSD

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5102301-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1510132-01 Source Sample: 5W7B

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Cobalt	110.0	119	106	0.865		20	75 - 125

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SERIAL DILUTION

EPA 6020A

5W7BL

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5J27005-SRD1 Matrix: Water Lab Source ID: 1510132-01 Source Sample: 5W7B

Sequence: 5J27005 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Cobalt	2.25 J	25.00 U	5.00			EPA 6020A	10

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DUPLICATES

EPA 6020A

5W7BD

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 5102301-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1510132-01 Source Sample: 5W7B

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Cobalt	20	*2.25 J*	2.24 J	0.527		EPA 6020A

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PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Batch: 5102301 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
5W7B	1510132-01	10/23/15 09:30	50.0	50.0
5W8B	1510132-02	10/23/15 09:30	50.0	50.0
5W5B	1510132-03	10/23/15 09:30	50.0	50.0
5WC21	1510132-04	10/23/15 09:30	50.0	50.0
5WDUP	1510132-05	10/23/15 09:30	50.0	50.0
5WC22	1510132-06	10/23/15 09:30	50.0	50.0
5WC23	1510132-07	10/23/15 09:30	50.0	50.0
5W12A	1510132-08	10/23/15 09:30	50.0	50.0
PBWPQ	5102301-BLK1	10/23/15 09:30	50.0	50.0
MLCSPQ	5102301-BS1	10/23/15 09:30	50.0	50.0
5W7BD	5102301-DUP1	10/23/15 09:30	50.0	50.0
5W7BS	5102301-MS1	10/23/15 09:30	50.0	50.0
5W7BSD	5102301-MSD1	10/23/15 09:30	50.0	50.0
5W7BA	5102301-PS1	10/23/15 09:30	50.0	50.0

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ANALYSIS DATA SHEET

5W7B

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-01 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	2.25	1.00	5.00	1	J	EPA 6020A	5J27005	10/27/15 11:51

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ANALYSIS DATA SHEET

5W8B

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-02 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5J27005	10/27/15 12:01

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ANALYSIS DATA SHEET

5W5B

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-03 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5J27005	10/27/15 12:03

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ANALYSIS DATA SHEET

5WC21

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-04 % Solid: Matrix: Water Sampled: 10/20/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	75.2	1.00	5.00	1		EPA 6020A	5J27005	10/27/15 12:08

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ANALYSIS DATA SHEET

5WDUP

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-05 % Solid: Matrix: Water Sampled: 10/20/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	72.6	1.00	5.00	1		EPA 6020A	5J27005	10/27/15 12:10

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ANALYSIS DATA SHEET

5WC22

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-06 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	23.9	1.00	5.00	1		EPA 6020A	5J27005	10/27/15 12:12

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ANALYSIS DATA SHEET

5WC23

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-07 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	7.08	1.00	5.00	1		EPA 6020A	5J27005	10/27/15 12:13

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

5W12A

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Lab ID: 1510132-08 % Solid: Matrix: Water Sampled: 10/19/15 Received: 10/22/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt		1.00	5.00	1	U	EPA 6020A	5J27005	10/27/15 12:15

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510132 Project: RAAP UNIT 5/2014-2015 Co ONLY

Sequence: 5J27005 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5J27005-ICB1	Cobalt	0.00470	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5J27005-CCB1	Cobalt	0.0171	1.00	5.00	ug/L	*U*	EPA 6020A
PBWPQ	5102301-BLK1	Cobalt		1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5J27005-CCB2	Cobalt	0.0270	1.00	5.00	ug/L	*U*	EPA 6020A
CCB	5J27005-CCB3	Cobalt	0.0270	1.00	5.00	ug/L	*U*	EPA 6020A

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

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2425 New Holland Pike, Lancaster, PA 17601 | 717-656-2300 | Fax: 717-656-2681 | www.LancasterLabs.com

Type I Data Package

Abridged data package. Full deliverable available.

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

Project: RAAP - Radford, VA - HWMU16
Groundwater and Water Samples
Collected on 10/13/15-10/14/15

SDG# RAE46

GROUP	SAMPLE NUMBERS
1601179	8090509-8090523

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by: Dana M Kauffman **Date:** **11/09/2015**

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Barbara Weyandt at (717) 556-7264.

2425 New Holland Pike, Lancaster, PA 17601 · 717-656-2300 · Fax: 717-656-2681 · www.LancasterLabs.com

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Sample Reference List for SDG Number RAE46
with a Data Package Type of I

11200 - Draper Aden Associates, Inc.

Project: RAAP - Radford, VA - HWMU16

Lab Sample Number	Lab Sample Code	Client Sample Description
8090509	R16C1	16C1 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090510	R16M8	16MW8 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090511	R16M9	16MW9 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090512	R161A	16WC1A Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090513	R161A	16WC1A MS Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090514	R161A	16WC1A MSD Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090515	R16FD	16WDUP Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090516	R161B	16WC1B Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090517	R16-2	16-2 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090518	R16-3	16-3 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090519	R16-5	16-5 Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090520	R162B	16WC2B Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090521	R16SP	16SPRING Grab Groundwater 2015-2nd Semiannual Monitoring Event
8090522	RTBK1	Trip Blank_1 Water 2015-2nd Semiannual Monitoring Event
8090523	RTBK2	Trip Blank_2 Water 2015-2nd Semiannual Monitoring Event

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Sample pH Log

SDG: RAE46

LLI Sample Number	Bottle Code	Actual pH	Exp. pH	pH Check Code	Adj. pH	Adjusted Date	Adjusted Time	Preservative Added	Preservative Lot #	LLI Supplied Bottle?	Sulfide Present?	Corrective Substance	CS Lot #	Res. Cl. Present?	Corrective Substance	CS Lot #
8090509	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090509	038B	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090510	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090511	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090511	038B	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090512	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090513	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090514	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090515	038B	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090516	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090517	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090518	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090519	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090520	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090521	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090522	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA
8090523	038A	<2	<2	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	NA	NA	NA

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added)
PA = Original container checked - pH adjusted to correct range. (Preservative was added)
PV = Volatile container checked
PC = pH checked (unpreserved container)
SPK = Subsampled from an original container. Original container checked - pH is within correct range
SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range.
SPC = Subsampled from an original container. pH checked (unpreserved container).
SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample.
UP = Unable to preserve due to matrix of the sample.
NA = Not applicable

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

01163 GC/MS VOA Water Prep

An undiluted aliquot of the water sample or a dilution of the sample is purged with an inert gas and the volatiles are collected on an adsorbent trap that is subsequently desorbed onto a gas chromatographic column.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 5030C, May 2003.

11996 VOCs- 25ml Water by 8260C

The water sample is purged and the volatile compounds are collected on a sorbent trap that is subsequently desorbed onto the GC/MS system for chromatographic and mass spectral analysis.

Reference: Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS), SW-846 Method 8260C, August 2006.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

November 03, 2015

Project: RAAP - Radford, VA - HWMU16

Submittal Date: 10/15/2015
Group Number: 1601179
SDG: RAE46
State of Sample Origin: VA

Client Sample Description	Lancaster Labs (LL) #
16C1 Grab Groundwater	8090509
16MW8 Grab Groundwater	8090510
16MW9 Grab Groundwater	8090511
16WC1A Grab Groundwater	8090512
16WC1A MS Grab Groundwater	8090513
16WC1A MSD Grab Groundwater	8090514
16WDUP Grab Groundwater	8090515
16WC1B Grab Groundwater	8090516
16-2 Grab Groundwater	8090517
16-3 Grab Groundwater	8090518
16-5 Grab Groundwater	8090519
16WC2B Grab Groundwater	8090520
16SPRING Grab Groundwater	8090521
Trip Blank_1 Water	8090522
Trip Blank_2 Water	8090523

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Kathy Olsen
ELECTRONIC COPY TO	Draper Aden Associates, Inc.	Attn: Janet Frazier

Respectfully Submitted,

Barbara Weyandt

Barbara A. Weyandt
Specialist

(717) 556-7264

Project Name: RAAP - Radford, VA - HWMU16
LL Group #: 1601179

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8090509, 8090510, 8090511, 8090512, 8090515, 8090516, 8090517, 8090518, 8090519, 8090520, 8090521, 8090522, 8090523

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

Sample Description: 16C1 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090509
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 15:10 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16C1 SDG#: RAE46-01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	4.8	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.7	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	55	31	2.5
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	1.7	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 17:35	Kerri E Legerlotz	1
11996	8260C (25 ml)	SW-846 8260C	1	H152991AB	10/26/2015 22:27	Kevin A Sposito	2.5
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 17:35	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H152991AB	10/26/2015 22:27	Kevin A Sposito	2.5

Sample Description: 16MW8 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090510
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 10:15 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16M8 SDG#: RAE46-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		**ug/l**	**ug/l**	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 15:05	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 15:05	Kerri E Legerlotz	1

Sample Description: 16MW9 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090511
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 14:15 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16M9 SDG#: RAE46-03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	2.5	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	7.4	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	50	50	4
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 18:18	Kerri E Legerlotz	1
11996	8260C (25 ml)	SW-846 8260C	1	H152991AB	10/26/2015 22:48	Kevin A Sposito	4
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 18:18	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	2	H152991AB	10/26/2015 22:48	Kevin A Sposito	4

Sample Description: 16WC1A Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090512
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 12:40 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R161A SDG#: RAE46-04BKG

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	1.8	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	16	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 11:53	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 11:53	Kerri E Legerlotz	1

Sample Description: 16WC1A MS Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090513
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 12:40 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R161A SDG#: RAE46-04MS

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	4.9	1.0	1
11996	2-Butanone	78-93-3	35	10	1
11996	Carbon Tetrachloride	56-23-5	4.7	1.0	1
11996	Chloroethane	75-00-3	5.4	1.0	1
11996	Chloromethane	74-87-3	4.4	1.0	1
11996	Dichlorodifluoromethane	75-71-8	3.9	1.0	1
11996	1,1-Dichloroethane	75-34-3	6.6	1.0	1
11996	1,1-Dichloroethene	75-35-4	4.7	1.0	1
11996	Ethyl ether	60-29-7	19	13	1
11996	Ethylbenzene	100-41-4	4.3	1.0	1
11996	Freon 113	76-13-1	4.9	1.0	1
11996	Methylene Chloride	75-09-2	4.6	1.0	1
11996	Tetrachloroethene	127-18-4	4.5	1.0	1
11996	Toluene	108-88-3	4.2	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	4.6	1.0	1
11996	Trichloroethene	79-01-6	4.9	1.0	1
11996	Trichlorofluoromethane	75-69-4	4.9	1.0	1
11996	Xylene (Total)	1330-20-7	13	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 12:15	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 12:15	Kerri E Legerlotz	1

Sample Description: 16WC1A MSD Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090514
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 12:40 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R161A SDG#: RAE46-04MSD

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	5.0	1.0	1
11996	2-Butanone	78-93-3	35	10	1
11996	Carbon Tetrachloride	56-23-5	4.7	1.0	1
11996	Chloroethane	75-00-3	5.2	1.0	1
11996	Chloromethane	74-87-3	4.3	1.0	1
11996	Dichlorodifluoromethane	75-71-8	3.8	1.0	1
11996	1,1-Dichloroethane	75-34-3	6.7	1.0	1
11996	1,1-Dichloroethene	75-35-4	4.9	1.0	1
11996	Ethyl ether	60-29-7	19	13	1
11996	Ethylbenzene	100-41-4	4.3	1.0	1
11996	Freon 113	76-13-1	5.0	1.0	1
11996	Methylene Chloride	75-09-2	4.8	1.0	1
11996	Tetrachloroethene	127-18-4	4.6	1.0	1
11996	Toluene	108-88-3	4.2	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	4.8	1.0	1
11996	Trichloroethene	79-01-6	5.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	4.7	1.0	1
11996	Xylene (Total)	1330-20-7	13	3.0	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 12:36	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 12:36	Kerri E Legerlotz	1

Sample Description: 16WDUP Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090515
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 13:30 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16FD SDG#: RAE46-05FD

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	1.9	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	16	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 19:01	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 19:01	Kerri E Legerlotz	1

Sample Description: 16WC1B Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090516
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 11:25 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R161B SDG#: RAE46-06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 15:26	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 15:26	Kerri E Legerlotz	1

Sample Description: 16-2 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090517
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/14/2015 09:10 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16-2 SDG#: RAE46-07

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 15:47	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 15:47	Kerri E Legerlotz	1

Sample Description: 16-3 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090518
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015 12:25 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16-3 SDG#: RAE46-08

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 16:09	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 16:09	Kerri E Legerlotz	1

Sample Description: 16-5 Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090519
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015 13:30 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16-5 SDG#: RAE46-09

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 16:30	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 16:30	Kerri E Legerlotz	1

Sample Description: 16WC2B Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090520
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015 14:50 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R162B SDG#: RAE46-10

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 16:52	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 16:52	Kerri E Legerlotz	1

Sample Description: 16SPRING Grab Groundwater
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090521
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015 13:45 by KC

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

R16SP SDG#: RAE46-11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 17:13	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 17:13	Kerri E Legerlotz	1

Sample Description: Trip Blank_1 Water
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090522
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RTBK1 SDG#: RAE46-12TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 11:10	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 11:10	Kerri E Legerlotz	1

Sample Description: Trip Blank_2 Water
2015-2nd Semiannual Monitoring Event
RAAP - Radford, VA - HWMU16

LL Sample # WW 8090523
LL Group # 1601179
Account # 11200

Project Name: RAAP - Radford, VA - HWMU16

Collected: 10/13/2015

Submitted: 10/15/2015 10:15
Reported: 11/03/2015 16:24

Draper Aden Associates, Inc.
2206 South Main Street
Blacksburg VA 24060

RTBK2 SDG#: RAE46-13TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l	ug/l	
11996	Benzene	71-43-2	< 1.0	1.0	1
11996	2-Butanone	78-93-3	< 10	10	1
11996	Carbon Tetrachloride	56-23-5	< 1.0	1.0	1
11996	Chloroethane	75-00-3	< 1.0	1.0	1
11996	Chloromethane	74-87-3	< 1.0	1.0	1
11996	Dichlorodifluoromethane	75-71-8	< 1.0	1.0	1
11996	1,1-Dichloroethane	75-34-3	< 1.0	1.0	1
11996	1,1-Dichloroethene	75-35-4	< 1.0	1.0	1
11996	Ethyl ether	60-29-7	< 13	13	1
11996	Ethylbenzene	100-41-4	< 1.0	1.0	1
11996	Freon 113	76-13-1	< 1.0	1.0	1
11996	Methylene Chloride	75-09-2	< 1.0	1.0	1
11996	Tetrachloroethene	127-18-4	< 1.0	1.0	1
11996	Toluene	108-88-3	< 1.0	1.0	1
11996	1,1,1-Trichloroethane	71-55-6	< 1.0	1.0	1
11996	Trichloroethene	79-01-6	< 1.0	1.0	1
11996	Trichlorofluoromethane	75-69-4	< 1.0	1.0	1
11996	Xylene (Total)	1330-20-7	< 3.0	3.0	1

A targeted library search was performed yielding the following results:
Dimethyl Ether is non-detect.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C (25 ml)	SW-846 8260C	1	H152991AA	10/26/2015 11:31	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	H152991AA	10/26/2015 11:31	Kerri E Legerlotz	1

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1601179
Reported: 11/03/2015 16:24

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank LOQ	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H152991AA	Sample number(s): 8090509-8090523							
Benzene	< 1.0	1.0	ug/l	113		80-120		
2-Butanone	< 10	10.	ug/l	91		66-135		
Carbon Tetrachloride	< 1.0	1.0	ug/l	108		79-129		
Chloroethane	< 1.0	1.0	ug/l	98		71-122		
Chloromethane	< 1.0	1.0	ug/l	94		63-121		
Dichlorodifluoromethane	< 1.0	1.0	ug/l	84		35-142		
1,1-Dichloroethane	< 1.0	1.0	ug/l	114		80-120		
1,1-Dichloroethene	< 1.0	1.0	ug/l	108		80-120		
Ethyl ether	< 13	13.	ug/l	106		60-129		
Ethylbenzene	< 1.0	1.0	ug/l	98		80-120		
Freon 113	< 1.0	1.0	ug/l	113		75-120		
Methylene Chloride	< 1.0	1.0	ug/l	112		80-120		
Tetrachloroethene	< 1.0	1.0	ug/l	101		80-120		
Toluene	< 1.0	1.0	ug/l	98		80-120		
1,1,1-Trichloroethane	< 1.0	1.0	ug/l	106		80-120		
Trichloroethene	< 1.0	1.0	ug/l	111		80-120		
Trichlorofluoromethane	< 1.0	1.0	ug/l	102		69-133		
Xylene (Total)	< 3.0	3.0	ug/l	96		80-120		
Batch number: H152991AB	Sample number(s): 8090509,8090511							
Ethyl ether	< 13	13.	ug/l	91		60-129		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: H152991AA	Sample number(s): 8090509-8090523 UNSPK: 8090512								
Benzene	98	100	80-120	2	30				
2-Butanone	94	93	66-135	1	30				
Carbon Tetrachloride	95	95	79-129	0	30				
Chloroethane	94	90	71-122	3	30				
Chloromethane	89	86	63-121	3	30				
Dichlorodifluoromethane	78	76	35-142	3	30				
1,1-Dichloroethane	95	98	80-120	2	30				
1,1-Dichloroethene	93	97	80-120	4	30				
Ethyl ether	73	68	60-129	1	30				
Ethylbenzene	87	86	80-120	1	30				

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Draper Aden Associates, Inc. Group Number: 1601179
Reported: 11/03/2015 16:24

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Freon 113	98	100	75-120	2	30				
Methylene Chloride	93	96	80-120	4	30				
Tetrachloroethene	90	91	80-120	1	30				
Toluene	84	85	80-120	1	30				
1,1,1-Trichloroethane	92	96	80-120	3	30				
Trichloroethene	99	100	80-120	1	30				
Trichlorofluoromethane	98	94	69-133	4	30				
Xylene (Total)	84	84	80-120	0	30				
Batch number: H152991AB	Sample number(s): 8090509,8090511 UNSPK: 8090512								
Ethyl ether	73	68	60-129	1	30				

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C (25 ml)
Batch number: H152991AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8090509	100	107	94	93
8090510	102	109	94	93
8090511	101	112	95	93
8090512	105	113	92	94
8090513	103	110	91	96
8090514	104	110	91	97
8090515	101	109	95	92
8090516	101	110	94	93
8090517	101	108	95	93
8090518	101	107	95	93
8090519	102	110	94	93
8090520	101	108	95	93
8090521	101	109	95	93
8090522	103	111	92	96
8090523	104	110	92	94
Blank	103	107	91	94
LCS	104	108	91	96
MS	103	110	91	96
MSD	104	110	91	97
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

11200/1601179/80920509-23

CHAIN OF CUSTODY RECORD

Laboratory: Eurofins Lancaster Laboratories Environmental, LLC , 2425 New Holland Pike, Lancaster, PA, 17605-2425/ Barb Wyant, Manager/ (717) 656-2300 AR 9/23/2015

Client: 0 **Attn:** 0 **Address:** 0 0 **Phone:** 0 **Fax:** 0 **Fax:** 0	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU16 **Event:** 2015 - 2nd Semiannual Monitoring Event **DAA JN:** B03204-13A **Lab JN:**		**Project Specific (PS) or Batch (B) QC:** **Sample Collection for Project Complete?** YES UPS: 1Z-754-02X-Y0-4253-6004 **Carrier:** **Tracking Number:**	

Box 1: Matrix		Box 2: Preservative		Box 3: Filtered/Unfiltered	Box 4: Sample Type	Invoice
SW Surface Water	T Trip Blank	A HCL	E NaOH	F Filtered	G Grab	Copy to Consultant: YES
GW Groundwater	E Equipment Blank	B HNO_3	F ZnAc	U Unfiltered	C Composite	Bill: CLIENT OTHER
L Leachate	P Product	C H_2SO_4	G Other (Specify)	**Box 5: Sample Container Type**		Preserved and shipped on ice: YES
S Soil	O Other	D $Na_2S_2O_3$	H None	P Plastic V VOA AG Amber Glass CG Clear Glass		

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample					<2								
Box 2 - Preservative					A								
Box 5 - Sample Container Type					3-40ml V								
Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	8260C/5030C - 25 ml purge								
16C1	10/14	1510	GW	3	X								
16MW8	10/14	1015	GW	3	X								
16MW9	10/14	1415	GW	3	X								
16WC1A	10/14	1240	GW	9	X								
16WDUP	10/14	1330	GW	3	X								
16WC1B	10/14	1125	GW	3	X								
16-2	10/14	0910	GW	3	X								
16-3	10/13	1225	GW	3	X								
16-5	10/13	1330	GW	3	X								
16WC2B	10/13	1450	GW	3	X								
16SPRING	10/13	1345	GW	3	X								
Trip Blank1	10/13	—	GW	3	X								
Trip Blank2	10/13	—	GW	3	X								
Trip Blank3			GW	3	X								

USE FOR QC

GENERAL NOTES:

1. DAA EDD required.
2. Level 1 deliverables required.
3. See attached target analyte list.
4. 1 Trip Blank to be analyzed per day of sample collection.
5. Project required LOQs attached. Please report these LOQs.
6. Report to at or above project QL's.

Clients Special Instructions: Level 1 with edd. See attached target analyte list. See Genral Notes block.

Received by lab in Good Condition X Yes ____ No Custody Seal Intact X Yes ____ No Temperature upon arrival 1.0 Received on Ice X Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 10/13/15	#1 Relinquished by (Signature):	Date: 10/14/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:	
Sampler Signature:	Time: 0730	Company Name: DAA	Time: 1700	Company Name:	Time:		
Sampler Name (Print): Abe Price	Date: 10/13/15	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date: 10/15/15	30 DYS ORG/6 MTHS INORG	
Sampler Signature:	Time: 0730	Company Name:	Time:	Company Name: (3) 10/15/15 ELLE	Time: 10/15		

AR 9/23/15 - 11/7 Attached

GR# 1601179

ANALYTICAL METHOD: 8260C/5030C 25 ml purge volume
TYPE METHOD: GCMS
CLASS: VOLATILE

No.	ANALYTE	CAS RN	Required LOQ (µg/l)
1.	Carbon tetrachloride	56-23-5	1
2.	chloromethane ; (Methyl chloride)	74-87-3	1
3.	2-butanone (methyl ethyl ketone - MEK)	78-93-3	10
4.	1,1-dichloroethane	75-34-3	1
5.	Dichlorodifluoromethane	75-71-8	1
6.	Ethylbenzene	100-41-4	1
7.	Tetrachloroethene	127-18-4	1
8.	Toluene (methyl benzene)	108-88-3	1
9.	1,1,1-trichloroethane (methyl chloroform)	71-55-6	1
10.	Trichloroethene	79-01-6	1
11.	Trichlorofluoromethane (CFC-11)	75-69-4	1
12.	Xylenes (total)	1330-20-7	3
13	Chloroethane	75-00-3	1
14	Diethyl ether	60-29-7	12.5
15	Dimethyl ether	115-10-6	12.5
16	Methylene chloride	75-09-2	1
17	1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1
18	Benzene	71-43-2	1
19	1,1-Dichloroethene	75-35-4	1

Notes
13-16 added 10/03. JCF
Revised 10/31/03 JCF

17 added 0704. Revised 7/28/2004
10/2008 JCF
18 added 04 2011. JCF
19 added 04 2014 KPO

JWK 9/22/15 2/2 AT 9/22/15

25 ml purge volume

.\\draperaden.net\daa\teams\environmental\bbg\databases\raap\sample event set up\semi-annual events\hwmu-16\hwmu16-target analyte list-q.doc JCF 11/04/2004

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 114377

Group Number(s): 1601179

Client: Draper Aden

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	10/15/2015 10:15
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	VI		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	No
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

Unpacked by Krista Abel (3058) at 13:49 on 10/15/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.0	DT	Wet	Y	Bagged	N

Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
Trip Blank 1	2	3	
Trip Blank 2	2	3	

Sample ID Discrepancy Details

Sample ID on COC	Sample ID on Label	Comments
Trip Blank 2	Trip Blank 3	

2425 New Holland Pike
Lancaster, PA 17605-2425
T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Liberty Analytical

10/27/2015

Abridged data package. Full deliverable available.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2015+ OBG/HWMU13/B03204-13

WorkOrder: 1510114

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1510112

Project: RAAP 2015+ OBG/HWMU13/B03204-13 **Sdg:** 1510112

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1510112-01	13MW5	Water	10/15/2015 10:30	10/16/2015 12:56
1510112-02	13MW6	Water	10/15/2015 11:50	10/16/2015 12:56
1510112-03	13MW7	Water	10/15/2015 13:00	10/16/2015 12:56
1510112-04	13MW3	Water	10/20/2015 14:30	10/22/2015 09:17
1510112-05	13MW4	Water	10/20/2015 15:50	10/22/2015 09:17
1510112-06	13MWDUP	Water	10/20/2015 16:00	10/22/2015 09:17

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Laboratory: Liberty Analytical

SDG: 1510114

Client Sample Id:	Analysis:	Lab Sample Id:
16WC1A	SW8270D	1510114-01
16C1	SW8270D	1510114-02
16MW8	SW8270D	1510114-03
16MW9	SW8270D	1510114-04
16WDUP	SW8270D	1510114-05
16WC1B	SW8270D	1510114-06
16-2	SW8270D	1510114-07
16-3	SW8270D	1510114-08
16-5	SW8270D	1510114-09
16WC2B	SW8270D	1510114-10
16SPRING	SW8270D	1510114-11

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Quentisha Forrester

Name: Quentisha Forrester

Date: 10/22/2015

Title: Chemist III

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

A. SDG Narrative

Liberty Analytical

501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # 1510114
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 16WC1A 16C1 16MW8 16MW9 16WDUP 16WC1B 16-2 16-3 16-5 16WC2B 16SPRING

The 11 aqueous samples listed above were received intact, temperatures ranging from 0.1°C to 0.6°C, with proper documentation, in sealed shipping containers, on October 16, 2015. These samples were scheduled for the requested analyses of the semivolatile fraction only. SW-846, 3rd Edition, Update 3, Separatory Funnel extraction (Method 3510C), and Method 8270D were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the narrative deals with the semivolatile fraction.

Semivolatile

Extraction and analysis holding time requirements were met for these samples.

No Semivolatile project analytes identified were confirmed above the Reporting Limit (RL) in these samples.

Manual integrations were performed in this SDG, as indicated on the detailed Manual Integration Summary report that is located in section S. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG.

All of the surrogates met recovery and retention time criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria.

16WC1A was used as the original to prepare the duplicate matrix spikes as requested. The associated duplicate matrix spikes met all of the advisory accuracy criteria. Laboratory Control Sample (LCS) were prepared and analyzed along with these samples and met all accuracy and precision criteria.

An uncertainty of these test results may be estimated from the recovery of the surrogates added to the sample prior to sample preparation or from the recovery of spiked compound(s) in the associated laboratory control sample. Further information is available upon request.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Furthermore, I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Quentisha Forrester
Chemist III
October 22, 2015

GC and GC/MS Column and Trap Specifications Table

COLUMNS

Columns Utilized	Brand Name	Coating Material	ID (mm)	Film Thickness (um)	Length (m)
	GC Laboratory				
DRO/ORO	Restek	RTX-5	0.53	1.0	30
	Restek	RTX-SMS	0.53	1.0	30
√	Restek	clpest	0.32	0.5	30
√	Restek	clpest2	0.32	0.42	30
	J&W	DB-210	0.53	1.0	30
RSK	J&W	GS-GASPRO	0.32	N/A	30
	GC Volatiles Laboratory				
GRO	Restek	RTX-Volatiles	0.53	2.0	30
	GC/MS Volatiles Laboratory				
	Restek	RTX-VMS	0.18	1.0	20
√	Supelco	SPB-624	0.32	1.8	60
	Supelco	SPB-624	0.53	3.0	75
	Phenomonex	ZB-624	0.32	1.8	60
	GC/MS Semivolatiles Laboratory				
√	Restek	RTX-5Sil MS	0.32	0.25	30
	HPLC Laboratory				
PAH	Supelco	Supelcosil LC-PAH	4.6	5.0	15 cm
PAH	Supelco	Discovery RP Amide C16	4.6	5.0	25 cm
EXP	Restek	Pinnacle Cyano	4.6	5.0	25 cm
EXP	Restek	Allure C18	4.6	5.0	25 cm

TRAPS

GC and GC/MS Volatiles Laboratory		
Supelco J (BETXTRAP™)	*** 7.7 cm Carbopack C**	
	*** 1.2 cm Carbopack B**	
√ **Supelco K (Vocarb3000)**	*** 10 cm of Carbopack B (Graphitized Carbons)**	
	*** 6 cm of Carboxen 1000 (Carbon molecular sieves)**	
	*** 1 cm of Carboxen 1001 (Carbon molecular sieves)**	

Rev. 30

This table contains the GC columns (and volatile organic trap) used for the analysis of volatiles, semivolatiles, pesticides, and Aroclors by the requested analytical methods. Please see the SDG Narrative(s) for the specific fraction(s) relative to this SDG.
Note: This table also contains HPLC columns.

Liberty Analytical

Liberty Analytical's Pagination Convention

As required by the EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is Liberty Analytical's policy to add an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.). This policy is also applicable to non-CLP data packages.

Revision 7 (01/12/2011)

Liberty Analytical

Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC/HPLC chemists. An Extracted Ion Current Profile (EICP) or a GC/HPLC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC/HPLC analysis. The manual editing/integration flags are:

M - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak. The most common reasons for performing manual integrations/editing are: the compound was not found by the automatic integration routine, the compound was incorrectly integrated by the automatic integration routine, and the co-eluting compounds were incorrectly integrated by the automatic integration routine.

H - Denotes that the data reviewer, GC/MS operator, or GC/HPLC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

MH - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

L - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

ML - Denotes that an alternate GC/MS library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

These codes will appear in the GC/MS and GC/HPLC raw data.

Revision 8 (01/29/2011)

Liberty Analytical

ORGANIC DATA REPORTING QUALIFIERS

On the appropriate reporting form, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on the appropriate reporting form for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1:1 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the adjusted CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide and/or Aroclor or other GC or HPLC identification criteria, and the result is less than the adjusted CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search and must be used with the J flag. For generic characterization of a TIC such as "chlorinated hydrocarbon" (or for an "unknown," with no matches $\geq$ 85%), the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on the Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the lower of the two values is reported and flagged with a P on the reporting form. When the RPD is equal to or less than 40%, our policy is to also report the lower of the two values, although the choice could be a project specific issue. These SW-846 policies are consistent with Method 8000C. If Method 8000B is required, the higher of the two values is reported. For certain HPLC analyses, if one of the HPLC columns displays co-elution of target analytes, all results are reported from a primary column displaying no co-elution. Results are still flagged with a P if the RPD between columns is greater than 40%.

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

DATA REPORTING QUALIFIERS (continued)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a concentration greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a concentration greater than the upper level of the calibration range will have the result flagged with an E on the appropriate reporting form for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on the appropriate reporting form for the more diluted sample, and **all** reported concentrations on that form are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds which are not detected in the sample analysis i.e. compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate reporting forms are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No. XXXXXDL) i.e. the results from both analyses <u>are not combined</u> on a single reporting form.

A: This flag indicates that a TIC is a suspected aldol-condensation product.

S: In the SOM01.2 SOW document, this flag is used to indicate an estimated value for Aroclor target compounds where a valid 5-point initial calibration was not performed prior to the analytes detection in a sample. If an “S” flag is used for a specific Aroclor, then a reanalysis of the sample is required after a valid 5-point calibration is performed for the detected Aroclor. The “S” flag is not utilized for non CLP analyses.

* This flag is applied to a target analyte when any QC acceptance criterion has not been met for that analyte. The flag appears on the reporting form of the associated QC analysis.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

Chain of Custody Records

The laboratory shall include a copy of the Chain-of-Custody (CoC) documentation for all of the samples in the Work Order/SDG.

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

9/23/2015

Client:	0	**Consultant:**	Draper Aden Associates	**Sample Site:**	RAAP, Radford, Virginia
Attn:	0	**Attn:**	Janet C. Frazier	**Project Specific (PS) or Batch (B) QC:**	
Address:	0	**Address:**	2206 South Main Street	**Sample Collection for Project Complete?**	YES
	0		Blacksburg, Virginia 24060	**Location:**	HWMU16
Phone:	0	**Phone:**	(540) 552-0444	**Event:**	2015 - 2nd Semiannual Monitoring Event
Fax:	0	**Fax:**	(540) 552-0291	**DAA JN:**	B03204-13A
Fax:	0			**Lab JN:**	
				Carrier:	DASH
				Tracking Number:	

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Box 4: Sample Type
G Grab; C Composite

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G	G						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					<2	<2	-						
Box 2 - Preservative					B	B	H						
Box 5 - Sample Container Type					1-500 ml P		2-1L A						

Sample ID	Date: 2015	Time	Box 1: Matrix	Number of Bottles	ICP/MS 6020A/3005A (Metals-Total)	7470A (Mercury-Total)	8270D/3510C (Semivolatiles)	metals pH					
16C1	10/14	1510	GW	3	X	X	X	<2		151014-02			
16MW8	10/14	1015	GW	3	X	X	X	<2		-03			
16MW9	10/14	1415	GW	3	X	X	X	<2		-04			
16WC1A	10/14	1240	GW	9	X	X	X	<2		-01			USE FOR QC
16WDUP	10/14	1330	GW	3	X	X	X	<2		-05			
16WC1B	10/14	1125	GW	3	X	X	X	<2		-06			
16-2	10/14	0910	GW	3	X	X	X	<2		151014-07			
16-3	10/13	1225	GW	3	X	X	X	<2		-08			
16-5	10/13	1330	GW	3	X	X	X	<2		-09			
16WC2B	10/13	1450	GW	3	X	X	X	<2		-10			
16SPRING	10/13	1345	GW	3	X	X	X	<2		-11			

GENERAL NOTES:
1. ERIS EDD & DAA EDD required.
2. Level 4 deliverables required.
3. See attached target analyte list
4. Report results at or above QL permit, (attached).

Clients Special Instructions: 0.6°C, 0.3°C, 0.1°C

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ Nc Temperature upon arrival ____ Received on Ice ✓ Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 10/13/15	#1 Relinquished by (Signature):	Date: 10/16/15	#2 Relinquished by (Signature):	Date: 10/16/15	Sample Storage Time Requested:	
Sampler Signature:	Time: 0730	Company Name: DAA	Time: 0910	Company Name: Dash Carrier	Time: 1256		
Sampler Name (Print): Abe Price	Date: 10/13/15	#1 Received by (Signature): Dash Carrier 10/16/15	Date: 10/16/15	#2 Received by (Signature):	Date: 10/16/15	30 DYS ORG/6 MTHS INORG	
Sampler Signature:	Time: 0730	Company Name:	Time: 910	Company Name: CompuChem/LIBRARY	Time: 1256		

9/23/15

1/3

ANALYTICAL METHOD: SEE BELOW
TYPE METHOD: SEE BELOW
CLASS: TOTAL

Method SW 846-6020A/3005 (ICP/MS)

No.	ANALYTE	CAS RN	Required LOQ (µg/l)
1.	Arsenic	7440-38-2	10
2.	Barium	7440-39-3	10
3.	Beryllium	7440-41-7	1
4.	Cadmium	7440-43-9	1
5.	Chromium	7440-47-3	5
6.	Cobalt	7440-48-4	5
7.	Copper	7440-50-8	5
8.	Lead	7440-92-1	1
9.	Nickel	7440-02-0	10
10.	Vanadium	7440-62-2	10
11.	Zinc	7440-66-6	10

Method SW 7470A/CVAA

12	Mercury	7439-97-6 2/7470A	2

Notes. Antimony, selenium and silver deleted 4-6,2012.
10/2013 JCF

JK 4/22/15

2/2 KT 2/22/15

ANALYTICAL METHOD: 8270D/3510C
TYPE METHOD: GCMS
CLASS: SEMIVOLATILE

No.	ANALYTE	CAS RN	Required LOQ (µg/l)
1.	2,4-dinitrotoluene	121-14-2	10
2.	2,6-dinitrotoluene	606-20-2	10
3.	Diethylphthalate		5

10/13 – diehtylphthate added

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Report To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone: (540) 552-0444
Fax: -

Invoice To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone :(540) 552-0444
Fax: -

Date Due:	11/05/2015 00:00 (20 day TAT)		
Received By:	Cathy Dover	Date Received:	10/16/2015 12:56
Logged In By:	Cathy Dover	Date Logged In:	10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb,
Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-01 16WC1A [Water] Sampled 10/14/2015 12:40 Eastern					**USE FOR QC**
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 12:40	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 12:40	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 12:40	10/16/2015 12:56	
1510114-02 16C1 [Water] Sampled 10/14/2015 15:10 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 15:10	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 15:10	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 15:10	10/16/2015 12:56	
1510114-03 16MW8 [Water] Sampled 10/14/2015 10:15 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 10:15	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 10:15	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 10:15	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
1510114-04 16MW9 [Water] Sampled 10/14/2015 14:15 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 14:15	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 14:15	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 14:15	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Date Due: 11/05/2015 00:00 (20 day TAT)

Received By: Cathy Dover — Date Received: 10/16/2015 12:56

Logged In By: Cathy Dover — Date Logged In: 10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb, Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-05 16WDUP [Water] Sampled 10/14/2015 13:30 Eastern					
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 13:30	10/16/2015 12:56	
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 13:30	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 13:30	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
1510114-06 16WC1B [Water] Sampled 10/14/2015 11:25 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 11:25	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 11:25	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 11:25	10/16/2015 12:56	
1510114-07 16-2 [Water] Sampled 10/14/2015 09:10 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 09:10	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 09:10	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 09:10	10/16/2015 12:56	
1510114-08 16-3 [Water] Sampled 10/13/2015 12:25 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 12:25	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 12:25	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 12:25	10/16/2015 12:56	
1510114-09 16-5 [Water] Sampled 10/13/2015 13:30 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 13:30	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 13:30	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 13:30	10/16/2015 12:56	
1510114-10 16WC2B [Water] Sampled 10/13/2015 14:50 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 14:50	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 14:50	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 14:50	10/16/2015 12:56	

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Date Due: 11/05/2015 00:00 (20 day TAT)

Received By: Cathy Dover — Date Received: 10/16/2015 12:56

Logged In By: Cathy Dover — Date Logged In: 10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb, Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-11 16SPRING [Water] Sampled 10/13/2015 13:45 Eastern					
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 13:45	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 13:45	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 13:45	10/16/2015 12:56	

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

SDG: 1510114 Instrument: 5972hp62

Sequence: 5J20001 Calibration: 5100604

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
Blank (5101909-BLK1) ug/L Lab File ID: 5101909-BLK162.d Analyzed: 10/20/15 11:46				
Nitrobenzene-d5	50.00	62	45 - 110	
2-Fluorobiphenyl	50.00	56	46 - 110	
Terphenyl-d14	50.00	63	59 - 110	
LCS (5101909-BS1) ug/L Lab File ID: 5101909-BS162.d Analyzed: 10/20/15 12:27				
Nitrobenzene-d5	50.00	91	45 - 110	
2-Fluorobiphenyl	50.00	88	46 - 110	
Terphenyl-d14	50.00	98	59 - 110	
16WC1A (1510114-01) ug/L Lab File ID: 1510114-0162.d Analyzed: 10/20/15 13:06				
Nitrobenzene-d5	50.00	87	45 - 110	
2-Fluorobiphenyl	50.00	75	46 - 110	
Terphenyl-d14	50.00	96	59 - 110	
Matrix Spike (5101909-MS1) ug/L Lab File ID: 5101909-MS162.d Analyzed: 10/20/15 13:46				
Nitrobenzene-d5	50.00	88	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
Terphenyl-d14	50.00	94	59 - 110	
Matrix Spike Dup (5101909-MSD1) ug/L Lab File ID: 5101909-MSD162.d Analyzed: 10/20/15 14:25				
Nitrobenzene-d5	50.00	89	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
Terphenyl-d14	50.00	97	59 - 110	
16C1 (1510114-02) ug/L Lab File ID: 1510114-0262.d Analyzed: 10/20/15 15:05				
Nitrobenzene-d5	50.00	78	45 - 110	
2-Fluorobiphenyl	50.00	71	46 - 110	
Terphenyl-d14	50.00	86	59 - 110	

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

SDG: 1510114 Instrument: 5972hp62

Sequence: 5J20001 Calibration: 5100604

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
16MW8 (1510114-03) ug/L Lab File ID: 1510114-0362.d Analyzed: 10/20/15 15:45				
Nitrobenzene-d5	50.00	88	45 - 110	
2-Fluorobiphenyl	50.00	78	46 - 110	
Terphenyl-d14	50.00	89	59 - 110	
16MW9 (1510114-04) ug/L Lab File ID: 1510114-0462.d Analyzed: 10/20/15 16:24				
Nitrobenzene-d5	50.00	82	45 - 110	
2-Fluorobiphenyl	50.00	76	46 - 110	
Terphenyl-d14	50.00	88	59 - 110	
16WDUP (1510114-05) ug/L Lab File ID: 1510114-0562.d Analyzed: 10/20/15 17:04				
Nitrobenzene-d5	50.00	85	45 - 110	
2-Fluorobiphenyl	50.00	76	46 - 110	
Terphenyl-d14	50.00	91	59 - 110	
16WC1B (1510114-06) ug/L Lab File ID: 1510114-0662.d Analyzed: 10/20/15 17:43				
Nitrobenzene-d5	50.00	95	45 - 110	
2-Fluorobiphenyl	50.00	86	46 - 110	
Terphenyl-d14	50.00	94	59 - 110	
16-2 (1510114-07) ug/L Lab File ID: 1510114-0762.d Analyzed: 10/20/15 18:23				
Nitrobenzene-d5	50.00	91	45 - 110	
2-Fluorobiphenyl	50.00	84	46 - 110	
Terphenyl-d14	50.00	93	59 - 110	
16-3 (1510114-08) ug/L Lab File ID: 1510114-0862.d Analyzed: 10/20/15 19:02				
Nitrobenzene-d5	50.00	82	45 - 110	
2-Fluorobiphenyl	50.00	77	46 - 110	
Terphenyl-d14	50.00	88	59 - 110	

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

SURROGATE STANDARD RECOVERY

SW8270D

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

SDG: 1510114 Instrument: 5972hp62

Sequence: 5J20001 Calibration: 5100604

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	Q
16-5 (1510114-09) ug/L				
Lab File ID: 1510114-0962.d	Analyzed: 10/20/15 19:42			
Nitrobenzene-d5	50.00	93	45 - 110	
2-Fluorobiphenyl	50.00	87	46 - 110	
Terphenyl-d14	50.00	93	59 - 110	
16WC2B (1510114-10) ug/L				
Lab File ID: 1510114-1062.d	Analyzed: 10/20/15 20:22			
Nitrobenzene-d5	50.00	89	45 - 110	
2-Fluorobiphenyl	50.00	84	46 - 110	
Terphenyl-d14	50.00	98	59 - 110	
16SPRING (1510114-11) ug/L				
Lab File ID: 1510114-1162.d	Analyzed: 10/20/15 21:01			
Nitrobenzene-d5	50.00	83	45 - 110	
2-Fluorobiphenyl	50.00	75	46 - 110	
Terphenyl-d14	50.00	88	59 - 110	

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LCS / LCS DUPLICATE SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101909-BS1 Matrix: Water Client ID: SLCSHQ Batch: 5101909

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
2,6-Dinitrotoluene	40.00	40.7	102		66 - 117
2,4-Dinitrotoluene	40.00	39.5	99		58 - 123
Diethylphthalate	40.00	37.9	95		64 - 114

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101909-MS1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
2,6-Dinitrotoluene	40.00	10 U	40.4	101		66 - 117
2,4-Dinitrotoluene	40.00	10 U	41.2	103		58 - 123
Diethylphthalate	40.00	5.0 U	37.1	93		64 - 114

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270D

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101909-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
2,6-Dinitrotoluene	40.00	40.3	101	0.3		30	66 - 117
2,4-Dinitrotoluene	40.00	40.5	101	2		30	58 - 123
Diethylphthalate	40.00	37.5	94	1		30	64 - 114

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PREPARATION BATCH SUMMARY

SW8270D

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Batch: 5101909 Matrix: Water Preparation: EPA 3510C_SVOA

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (uL)
16WC1A	1510114-01	10/19/15 14:16	1000	1000
16C1	1510114-02	10/19/15 14:16	1000	1000
16MW8	1510114-03	10/19/15 14:16	1000	1000
16MW9	1510114-04	10/19/15 14:16	1000	1000
16WDUP	1510114-05	10/19/15 14:16	1000	1000
16WC1B	1510114-06	10/19/15 14:16	1000	1000
16-2	1510114-07	10/19/15 14:16	1000	1000
16-3	1510114-08	10/19/15 14:16	1000	1000
16-5	1510114-09	10/19/15 14:16	1000	1000
16WC2B	1510114-10	10/19/15 14:16	1000	1000
16SPRING	1510114-11	10/19/15 14:16	1000	1000
SBLKHQ	5101909-BLK1	10/19/15 14:16	1000	1000
SLCSHQ	5101909-BS1	10/19/15 14:16	1000	1000
16WC1AMS	5101909-MS1	10/19/15 14:16	1000	1000
16WC1AMSD	5101909-MSD1	10/19/15 14:16	1000	1000

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ANALYSIS DATA SHEET

SW8270D

16-2

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0762.d Sampled: 10/14/15 09:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-07 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 18:23

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	45.71	91	45 - 110	
2-Fluorobiphenyl	50.00	41.83	84	46 - 110	
Terphenyl-d14	50.00	46.64	93	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16-3

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0862.d Sampled: 10/13/15 12:25

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-08 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 19:02

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	40.85	82	45 - 110	
2-Fluorobiphenyl	50.00	38.47	77	46 - 110	
Terphenyl-d14	50.00	43.98	88	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16-5

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0962.d Sampled: 10/13/15 13:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-09 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 19:42

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	46.34	93	45 - 110	
2-Fluorobiphenyl	50.00	43.54	87	46 - 110	
Terphenyl-d14	50.00	46.35	93	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16C1

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0262.d Sampled: 10/14/15 15:10

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-02 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 15:05

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	38.78	78	45 - 110	
2-Fluorobiphenyl	50.00	35.54	71	46 - 110	
Terphenyl-d14	50.00	42.87	86	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16MW8

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0362.d Sampled: 10/14/15 10:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-03 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 15:45

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	44.12	88	45 - 110	
2-Fluorobiphenyl	50.00	38.99	78	46 - 110	
Terphenyl-d14	50.00	44.26	89	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16MW9

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0462.d Sampled: 10/14/15 14:15

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-04 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 16:24

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	41.14	82	45 - 110	
2-Fluorobiphenyl	50.00	38.13	76	46 - 110	
Terphenyl-d14	50.00	43.78	88	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16SPRING

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-1162.d Sampled: 10/13/15 13:45

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-11 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 21:01

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	41.66	83	45 - 110	
2-Fluorobiphenyl	50.00	37.50	75	46 - 110	
Terphenyl-d14	50.00	44.21	88	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0162.d Sampled: 10/14/15 12:40

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-01 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 13:06

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	43.30	87	45 - 110	
2-Fluorobiphenyl	50.00	37.68	75	46 - 110	
Terphenyl-d14	50.00	48.17	96	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0662.d Sampled: 10/14/15 11:25

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-06 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 17:43

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	47.34	95	45 - 110	
2-Fluorobiphenyl	50.00	43.13	86	46 - 110	
Terphenyl-d14	50.00	47.00	94	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WC2B

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-1062.d Sampled: 10/13/15 14:50

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-10 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 20:22

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	44.68	89	45 - 110	
2-Fluorobiphenyl	50.00	41.87	84	46 - 110	
Terphenyl-d14	50.00	48.77	98	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

16WDUP

Client: DRAPER ADEN ASSOCIATES SDG 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 1510114-0562.d Sampled: 10/14/15 13:30

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 1510114-05 Received: 10/16/15 12:56

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 17:04

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	*U*
121-14-2	2,4-Dinitrotoluene			10	*U*
84-66-2	Diethylphthalate			5.0	*U*

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	42.54	85	45 - 110	
2-Fluorobiphenyl	50.00	37.89	76	46 - 110	
Terphenyl-d14	50.00	45.68	91	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

SBLKHQ

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5101909-BLK162.d QC Type: Blank

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5101909-BLK1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 11:46

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene			10	U
121-14-2	2,4-Dinitrotoluene			10	U
84-66-2	Diethylphthalate			5.0	U

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	30.86	62	45 - 110	
2-Fluorobiphenyl	50.00	27.98	56	46 - 110	
Terphenyl-d14	50.00	31.50	63	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

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ANALYSIS DATA SHEET

SW8270D

SLCSHQ

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5101909-BS162.d QC Type: LCS

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5101909-BS1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 12:27

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene	40.7		10	
121-14-2	2,4-Dinitrotoluene	39.5		10	
84-66-2	Diethylphthalate	37.9		5.0	

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	45.73	91	45 - 110	
2-Fluorobiphenyl	50.00	43.80	88	46 - 110	
Terphenyl-d14	50.00	48.97	98	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.
(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.
(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16WC1AMS

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5101909-MS162.d QC Type: Matrix Spike

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5101909-MS1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 13:46

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene	40.4		10	
121-14-2	2,4-Dinitrotoluene	41.2		10	
84-66-2	Diethylphthalate	37.1		5.0	

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	43.83	88	45 - 110	
2-Fluorobiphenyl	50.00	42.89	86	46 - 110	
Terphenyl-d14	50.00	47.21	94	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

ANALYSIS DATA SHEET

SW8270D

16WC1AMSD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water Extraction: EPA 3510C_SVOA File ID: 5101909-MSD162.d QC Type: Matrix Spike Dup

Initial/Final: 1000mL / 1000uL Sulfur Cleanup: N Lab ID: 5101909-MSD1 Column ID: RTX-5Sil MS

Dilution: 1 pH: Florisil Cleanup: N Prepared: 10/19/15 14:16

% Moisture: NA GPC Cleanup: N GPC Cleanup Factor: N Analyzed: 10/20/15 14:25

Batch: 5101909 Sequence: 5J20001 Calibration: 5100604 Instrument: 5972hp62

CAS NO.	COMPOUND	CONC.(ug/L)	MDL	RL	Q
606-20-2	2,6-Dinitrotoluene	40.3		10	
121-14-2	2,4-Dinitrotoluene	40.5		10	
84-66-2	Diethylphthalate	37.5		5.0	

SURROGATE RECOVERY RESULTS	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Nitrobenzene-d5	50.00	44.34	89	45 - 110	
2-Fluorobiphenyl	50.00	43.23	86	46 - 110	
Terphenyl-d14	50.00	48.60	97	59 - 110	

(1) - N-nitrosodiphenylamine cannot be separated from diphenylamine. It is acceptable to report the combined result.

(2) - 1,2-Diphenylhydrazine is unstable and converts to azobenzene.

(3) - 3 & 4-Methylphenol cannot be separated for quantitation.

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

Liberty Analytical

10/23/2015

Abridged data package. Full deliverable available.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

WorkOrder: 1510114

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1510114

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A **Sdg:** 1510114

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1510114-01	16WC1A	Water	10/14/2015 12:40	10/16/2015 12:56
1510114-02	16C1	Water	10/14/2015 15:10	10/16/2015 12:56
1510114-03	16MW8	Water	10/14/2015 10:15	10/16/2015 12:56
1510114-04	16MW9	Water	10/14/2015 14:15	10/16/2015 12:56
1510114-05	16WDUP	Water	10/14/2015 13:30	10/16/2015 12:56
1510114-06	16WC1B	Water	10/14/2015 11:25	10/16/2015 12:56
1510114-07	16-2	Water	10/14/2015 09:10	10/16/2015 12:56
1510114-08	16-3	Water	10/13/2015 12:25	10/16/2015 12:56
1510114-09	16-5	Water	10/13/2015 13:30	10/16/2015 12:56
1510114-10	16WC2B	Water	10/13/2015 14:50	10/16/2015 12:56
1510114-11	16SPRING	Water	10/13/2015 13:45	10/16/2015 12:56

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Laboratory: Liberty Analytical

SDG: 1510114

Client Sample Id:	Analysis:	Lab Sample Id:
16WC1A	EPA 7470A	1510114-01
16WC1A	EPA 6020A	1510114-01
16C1	EPA 6020A	1510114-02
16C1	EPA 7470A	1510114-02
16MW8	EPA 6020A	1510114-03
16MW8	EPA 7470A	1510114-03
16MW9	EPA 6020A	1510114-04
16MW9	EPA 7470A	1510114-04
16MW9	EPA 6020A	1510114-04RE1
16WDUP	EPA 6020A	1510114-05
16WDUP	EPA 7470A	1510114-05
16WC1B	EPA 7470A	1510114-06
16WC1B	EPA 6020A	1510114-06
16-2	EPA 6020A	1510114-07
16-2	EPA 7470A	1510114-07
16-3	EPA 6020A	1510114-08
16-3	EPA 7470A	1510114-08
16-3	EPA 6020A	1510114-08RE1
16-5	EPA 6020A	1510114-09
16-5	EPA 7470A	1510114-09
16WC2B	EPA 6020A	1510114-10
16WC2B	EPA 7470A	1510114-10
16SPRING	EPA 7470A	1510114-11
16SPRING	EPA 6020A	1510114-11

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass

Name: Susan Bass

Date: 10/26/2015

Title: Chemist III

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

A. SDG Narrative

Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1510114
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2013+UNIT 16 & 10/B03204-13A

The indicated Sample Delivery Group (SDG) consisting of eleven (11) water samples was received into the laboratory information management system (LIMS) on October 16, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The samples temperature was 0.1, 0.3, and 0.6 degrees Celsius. Temperature was recorded by IR temperature gun.

The samples were prepared and analyzed in accordance with SW846 6020A/7470A methodology for the requested metals and mercury.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Barium for sample 16WC1A

$$\frac{239.2989\ \mu g/L\ (C) \times 0.05\ L\ (F)}{0.05\ L\ (I)} = 239.3\ \mu g/L \text{ reported as } 239\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5101914-MS1 (16WC1AS) was found to be inside control limits.

The mercury sample matrix spike, CCN = 5101915-MS1 (16WC1AS) was found to be inside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5101914-MS1 (16WC1AS) was found to be inside control limits.

The mercury sample matrix duplicate spike, CCN = 5101915-MSD1 (16WC1ASD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5101914-DUP1 (16WC1AD) was found to be inside control limits.

The mercury sample duplicate, CCN = 5101915-DUP1 (16WC1AD) was found to be inside control limits.

A five-fold serial dilution of sample, CCN = SDI1504088-01 (16WC1AL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5101914-PS1 (16WC1AA) was performed and passed criteria except zinc.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
October 26, 2015

Liberty Analytical

Liberty Analytical's Pagination Convention

As required by the EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is Liberty Analytical's policy to add an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.). This policy is also applicable to non-CLP data packages.

Revision 7 (01/12/2011)

Liberty Analytical

INORGANIC DATA REPORTING QUALIFIERS

On the appropriate reporting form, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. In the absence of specific qualifiers in the analytical method requested, the laboratory utilizes EPA CLP qualifiers. The qualifiers used are:

U : This flag indicates the compound was analyzed for, not detected and is reported as less than the Method Detection Limit (MDL) (or as defined by the client). The Reporting Limit (RL), or Limit of Quantitation (LOQ), and the MDL will be adjusted to reflect any dilution or concentration of the sample and, for soils, the percent moisture.

J : This flag indicates the reported result is an estimated value. The flag is used when an analyte is detected and the result is less than the adjusted RL/LOQ but equal to or greater than the MDL.

Q : This flag denotes that one or more quality control criteria have failed (e.g., LCS recovery, Continuing Calibration Verification, CCV, and interference check standards for ICP-AES/ICP-MS) and reanalyses can't be performed. The Q flag is applied to all specific analyte(s) in all samples associated with the failed quality control criteria.

B : This flag is used when the analyte is found in the associated method or calibration blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

D: This flag is applied to an analyte when the reported result is based on a dilution.

* This flag is applied to a target analyte when any QC acceptance criterion has not been met for that analyte. The flag appears on the reporting form of the associated QC analysis. The flag is applied if matrix spike recoveries are out of control limits and the sample result is ≤ 4X the spike added. The flag is also applied if duplicates are out of control. If both sample and duplicate values are ≥ 5X RL, then the RPD must be ≤ 20%. If either value (sample or duplicate) is < 5X RL, the absolute difference between the values has to be < CRQL to be in control. This flag is also applied to outliers in the serial dilution test. Any analytes with a sufficiently high concentration (minimally 10X RL after a 1:5 dilution) will have the flag applied if the dilution analysis doesn't agree within ± 10% of the original determination.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

The extensions: D, S, SD, L, and A are added to the end of the Client ID and represent the following:

D – Matrix Duplicate
S – Matrix Spike
SD – Matrix Spike Duplicate
L – Serial Dilution
A – Post Digestion Spike

Revision 3 (08-11-2015)

Chain of Custody Records

The laboratory shall include a copy of the Chain-of-Custody (CoC) documentation for all of the samples in the Work Order/SDG.

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

9/23/2015

Client:	0	**Consultant:**	Draper Aden Associates	**Sample Site:**	RAAP, Radford, Virginia
Attn:	0	**Attn:**	Janet C. Frazier	**Project Specific (PS) or Batch (B) QC:**	
Address:	0	**Address:**	2206 South Main Street	**Sample Collection for Project Complete?**	YES
	0		Blacksburg, Virginia 24060	**Location:**	HWMU16
Phone:	0	**Phone:**	(540) 552-0444	**Event:**	2015 - 2nd Semiannual Monitoring Event
Fax:	0	**Fax:**	(540) 552-0291	**DAA JN:**	B03204-13A
Fax:	0			**Lab JN:**	
				Carrier:	DASH
				Tracking Number:	

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on ice: YES

Box 4 - Sample Type					G	G	G						
Box 3 - Filtered/Unfiltered					U	U	U						
Required pH of Sample					<2	<2	-						
Box 2 - Preservative					B	B	H						
Box 5 - Sample Container Type					1-500 ml P		2-1L A						
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**ICP/MS 6020A/3005A (Metals-Total)**	**7470A (Mercury-Total)**	**8270D/3510C (Semivolatiles)**	**metals pH**					
16C1	10/14	1510	GW	3	X	X	X	<2		151014-02			
16MW8	10/14	1015	GW	3	X	X	X	<2		-03			
16MW9	10/14	1415	GW	3	X	X	X	<2		-04			
16WC1A	10/14	1240	GW	9	X	X	X	<2		-01			USE FOR QC
16WDUP	10/14	1330	GW	3	X	X	X	<2		-05			
16WC1B	10/14	1125	GW	3	X	X	X	<2		-06			
16-2	10/14	0910	GW	3	X	X	X	<2		151014-07			
16-3	10/13	1225	GW	3	X	X	X	<2		-08			
16-5	10/13	1330	GW	3	X	X	X	<2		-09			
16WC2B	10/13	1450	GW	3	X	X	X	<2		-10			
16SPRING	10/13	1345	GW	3	X	X	X	<2		-11			

GENERAL NOTES:
1. ERIS EDD & DAA EDD required.
2. Level 4 deliverables required.
3. See attached target analyte list
4. Report results at or above QL permit, (attached).

Clients Special Instructions: 0.6°C, 0.3°C, 0.1°C

Received by lab in Good Condition ✓ Yes ____ No Custody Seal Intact ✓ Yes ____ No Temperature upon arrival ____ Received on Ice ✓ Yes ____ No

Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 10/13/15	#1 Relinquished by (Signature):	Date: 10/16/15	#2 Relinquished by (Signature):	Date: 10/16/15	Sample Storage Time Requested:
Sampler Signature:	Time: 0730	Company Name: DAA	Time: 0910	Company Name: Dash Carrier	Time: 1256	
Sampler Name (Print): Abe Price	Date: 10/13/15	#1 Received by (Signature): Dash Carrier 10/16/15	Date: 10/16/15	#2 Received by (Signature):	Date: 10/16/15	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0730	Company Name:	Time: 910	Company Name: CompuChem/LIBRARY	Time: 1256	

9/23/15

1/3

ANALYTICAL METHOD: SEE BELOW
TYPE METHOD: SEE BELOW
CLASS: TOTAL

Method SW 846-6020A/3005 (ICP/MS)

No.	ANALYTE	CAS RN	Required LOQ (µg/l)
1.	Arsenic	7440-38-2	10
2.	Barium	7440-39-3	10
3.	Beryllium	7440-41-7	1
4.	Cadmium	7440-43-9	1
5.	Chromium	7440-47-3	5
6.	Cobalt	7440-48-4	5
7.	Copper	7440-50-8	5
8.	Lead	7440-92-1	1
9.	Nickel	7440-02-0	10
10.	Vanadium	7440-62-2	10
11.	Zinc	7440-66-6	10

Method SW 7470A/CVAA

12	Mercury	7439-97-6 2/7470A	2

Notes. Antimony, selenium and silver deleted 4-6,2012.
10/2013 JCF

JK 4/22/15

2/2 AT 2/22/15

ANALYTICAL METHOD: 8270D/3510C
TYPE METHOD: GCMS
CLASS: SEMIVOLATILE

No.	ANALYTE	CAS RN	Required LOQ (µg/l)
1.	2,4-dinitrotoluene	121-14-2	10
2.	2,6-dinitrotoluene	606-20-2	10
3.	Diethylphthalate		5

10/13 – diehtylphthate added

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Report To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone: (540) 552-0444
Fax: -

Invoice To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone :(540) 552-0444
Fax: -

Date Due:	11/05/2015 00:00 (20 day TAT)		
Received By:	Cathy Dover	Date Received:	10/16/2015 12:56
Logged In By:	Cathy Dover	Date Logged In:	10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb,
Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-01 16WC1A [Water] Sampled 10/14/2015 12:40 Eastern					**USE FOR QC**
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 12:40	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 12:40	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 12:40	10/16/2015 12:56	
1510114-02 16C1 [Water] Sampled 10/14/2015 15:10 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 15:10	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 15:10	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 15:10	10/16/2015 12:56	
1510114-03 16MW8 [Water] Sampled 10/14/2015 10:15 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 10:15	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 10:15	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 10:15	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
1510114-04 16MW9 [Water] Sampled 10/14/2015 14:15 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 14:15	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 14:15	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 14:15	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Date Due: 11/05/2015 00:00 (20 day TAT)

Received By: Cathy Dover — Date Received: 10/16/2015 12:56

Logged In By: Cathy Dover — Date Logged In: 10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb, Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-05 16WDUP [Water] Sampled 10/14/2015 13:30 Eastern					
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 13:30	10/16/2015 12:56	
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 13:30	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 13:30	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
1510114-06 16WC1B [Water] Sampled 10/14/2015 11:25 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 11:25	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 11:25	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 11:25	10/16/2015 12:56	
1510114-07 16-2 [Water] Sampled 10/14/2015 09:10 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/21/2015 09:10	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/11/2015 09:10	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/11/2016 09:10	10/16/2015 12:56	
1510114-08 16-3 [Water] Sampled 10/13/2015 12:25 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 12:25	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 12:25	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 12:25	10/16/2015 12:56	
1510114-09 16-5 [Water] Sampled 10/13/2015 13:30 Eastern					
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 13:30	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 13:30	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 13:30	10/16/2015 12:56	
1510114-10 16WC2B [Water] Sampled 10/13/2015 14:50 Eastern					
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 14:50	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 14:50	10/16/2015 12:56	
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 14:50	10/16/2015 12:56	

1510114

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2013+ UNIT 16 & 10/B03204-13A**	**Project Number:**	**RAAP 2013+ UNIT 16 & 10/B03204-13A**
SDG:	**1510114** **CASE:**	**Status:**	**Prepared**

Date Due: 11/05/2015 00:00 (20 day TAT)

Received By: Cathy Dover — Date Received: 10/16/2015 12:56

Logged In By: Cathy Dover — Date Logged In: 10/16/2015 18:43

J & B Flags?: **NO**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **RL/CRQL**	Spike Level: **FULL Spike**		

NOTE SAMPLING DATES!!1510114-01 FOR QC*SVOC 8270D FULL SCAN=HWMU16 (SHORT 1 SPIKE ONLY) .SUB (WITH SPECIAL PROJECT RL)*6020A METALS=,As,Ba,Be,Cd,Cr,Co,Cu,Pb, Ni,V & Zn + Hg 7470A*NO J FLAGS AND USE NO-MDL CUSTOM REPORT FOR FORMS.

Analysis	Due	TAT	Expires	Received	Comments
1510114-11 16SPRING [Water] Sampled 10/13/2015 13:45 Eastern					
6020A ICP MS (UPDATE IV)	11/05/2015 16:00	20	04/10/2016 13:45	10/16/2015 12:56	
SVOC 8270D	11/05/2015 16:00	20	10/20/2015 13:45	10/16/2015 12:56	SubList = SV - HWMU16 (10-24-13)
7470A 7471B Mercury	11/05/2015 16:00	20	11/10/2015 13:45	10/16/2015 12:56	

METHOD DETECTION AND REPORTING LIMITS

Laboratory: Liberty Analytical **SDG:** 1510114

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Arsenic	0.14	10.0	ug/L	EPA 6020A
Barium	0.1	10.0	ug/L	EPA 6020A
Beryllium	0.033	1.00	ug/L	EPA 6020A
Cadmium	0.011	1.00	ug/L	EPA 6020A
Chromium	0.068	5.00	ug/L	EPA 6020A
Cobalt	0.0095	5.00	ug/L	EPA 6020A
Copper	0.12	5.00	ug/L	EPA 6020A
Lead	0.021	1.00	ug/L	EPA 6020A
Nickel	0.0091	10.0	ug/L	EPA 6020A
Vanadium	0.056	10.0	ug/L	EPA 6020A
Zinc	0.12	10.0	ug/L	EPA 6020A

Liberty Analytical

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METHOD DETECTION AND REPORTING LIMITS

Laboratory: Liberty Analytical **SDG:** 1510114

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP 2013+ UNIT 16 & 10/B03204-13A

Matrix: Water **Instrument:** V4

Analyte	MDL	RL	Units	Method
Mercury	0.2	2.00	ug/L	EPA 7470A

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101914-BS1 Matrix: Water Client ID: MLCSPL Batch: 5101914

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Arsenic	220.0	224	102		80 - 120
Barium	110.0	116	105		80 - 120
Beryllium	110.0	109	98.9		80 - 120
Cadmium	110.0	113	103		80 - 120
Chromium	110.0	111	101		80 - 120
Cobalt	110.0	114	103		80 - 120
Copper	110.0	117	107		80 - 120
Lead	220.0	215	97.8		80 - 120
Nickel	110.0	115	104		80 - 120
Vanadium	110.0	113	102		80 - 120
Zinc	220.0	227	103		80 - 120

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LCS / LCS DUPLICATE SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101915-BS1 Matrix: Water Client ID: MLCSPM Batch: 5101915

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Mercury	4.000	3.99	100		80 - 120

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101914-MS1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Arsenic	220.0	10.0 U	211	95.4		75 - 125
Barium	110.0	239	354	104		75 - 125
Beryllium	110.0	1.00 U	99.9	90.8		75 - 125
Cadmium	110.0	1.00 U	109	99.0		75 - 125
Chromium	110.0	5.00 U	106	96.6		75 - 125
Cobalt	110.0	5.38	111	96.0		75 - 125
Copper	110.0	5.00 U	107	96.8		75 - 125
Lead	220.0	1.00 U	217	98.7		75 - 125
Nickel	110.0	10.0 U	114	97.0		75 - 125
Vanadium	110.0	10.0 U	111	101		75 - 125
Zinc	220.0	10.0 U	199	87.6		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101914-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Arsenic	220.0	216	98.1	2.78		20	75 - 125
Barium	110.0	350	101	3.00		20	75 - 125
Beryllium	110.0	102	92.7	2.05		20	75 - 125
Cadmium	110.0	111	101	1.92		20	75 - 125
Chromium	110.0	109	98.8	2.30		20	75 - 125
Cobalt	110.0	112	97.0	1.04		20	75 - 125
Copper	110.0	107	96.3	0.478		20	75 - 125
Lead	220.0	221	100	1.75		20	75 - 125
Nickel	110.0	113	96.2	0.857		20	75 - 125
Vanadium	110.0	112	102	0.861		20	75 - 125
Zinc	220.0	205	90.5	3.24		20	75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101915-MS1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Mercury	1.000	2.00 U	0.953	95		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 7470A

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101915-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Mercury	1.000	0.937	94	2		20	75 - 125

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SERIAL DILUTION

EPA 6020A

16WC1AL

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5J23003-SRD2 Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

Sequence: 5J23003 Dilution: 5 Report to MDL: NO

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Arsenic	10.00 U	50.00 U	10.0			EPA 6020A	10
Barium	239.30	240.03	10.0	0.306		EPA 6020A	10
Beryllium	1.00 U	5.00 U	1.00			EPA 6020A	10
Cadmium	1.00 U	5.00 U	1.00			EPA 6020A	10
Chromium	5.00 U	25.00 U	5.00			EPA 6020A	10
Cobalt	5.38	25.00 U	5.00			EPA 6020A	10
Copper	5.00 U	25.00 U	5.00			EPA 6020A	10
Lead	1.00 U	5.00 U	1.00			EPA 6020A	10
Nickel	10.00 U	50.00 U	10.0			EPA 6020A	10
Vanadium	10.00 U	50.00 U	10.0			EPA 6020A	10
Zinc	10.00 U	50.00 U	10.0			EPA 6020A	10

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DUPLICATES

EPA 6020A

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101914-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Arsenic	20	*10.0 U*	10.0 U			EPA 6020A
Barium	20	*239*	238	0.377		EPA 6020A
Beryllium	20	*1.00 U*	1.00 U			EPA 6020A
Cadmium	20	*1.00 U*	1.00 U			EPA 6020A
Chromium	20	*5.00 U*	5.00 U			EPA 6020A
Cobalt	20	*5.38*	5.43	0.880		EPA 6020A
Copper	20	*5.00 U*	5.00 U			EPA 6020A
Lead	20	*1.00 U*	1.00 U			EPA 6020A
Nickel	20	*10.0 U*	10.0 U			EPA 6020A
Vanadium	20	*10.0 U*	10.0 U			EPA 6020A
Zinc	20	*10.0 U*	10.0 U			EPA 6020A

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DUPLICATES

EPA 7470A

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 5101915-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1510114-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Mercury	20	*2.00 U*	2.00 U			EPA 7470A

Liberty Analytical

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PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Batch: 5101914 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1510114-01	10/20/15 10:28	50.0	50.0
16C1	1510114-02	10/20/15 10:28	50.0	50.0
16MW8	1510114-03	10/20/15 10:28	50.0	50.0
16MW9	1510114-04	10/20/15 10:28	50.0	50.0
16MW9	1510114-04RE1	10/20/15 10:28	50.0	50.0
16WDUP	1510114-05	10/20/15 10:28	50.0	50.0
16WC1B	1510114-06	10/20/15 10:28	50.0	50.0
16-2	1510114-07	10/20/15 10:28	50.0	50.0
16-3	1510114-08	10/20/15 10:28	50.0	50.0
16-3	1510114-08RE1	10/20/15 10:28	50.0	50.0
16-5	1510114-09	10/20/15 10:28	50.0	50.0
16WC2B	1510114-10	10/20/15 10:28	50.0	50.0
16SPRING	1510114-11	10/20/15 10:28	50.0	50.0
PBWPL	5101914-BLK1	10/20/15 10:28	50.0	50.0
MLCSPL	5101914-BS1	10/20/15 10:28	50.0	50.0
16WC1AD	5101914-DUP1	10/20/15 10:28	50.0	50.0
16WC1AS	5101914-MS1	10/20/15 10:28	50.0	50.0
16WC1ASD	5101914-MSD1	10/20/15 10:28	50.0	50.0
16WC1AA	5101914-PS1	10/20/15 10:28	50.0	50.0

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PREPARATION BATCH SUMMARY

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Batch: 5101915 Matrix: Water Preparation: EPA 7470A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1510114-01	10/20/15 10:28	100	100
16C1	1510114-02	10/20/15 10:28	100	100
16MW8	1510114-03	10/20/15 10:28	100	100
16MW9	1510114-04	10/20/15 10:28	100	100
16WDUP	1510114-05	10/20/15 10:28	100	100
16WC1B	1510114-06	10/20/15 10:28	100	100
16-2	1510114-07	10/20/15 10:28	100	100
16-3	1510114-08	10/20/15 10:28	100	100
16-5	1510114-09	10/20/15 10:28	100	100
16WC2B	1510114-10	10/20/15 10:28	100	100
16SPRING	1510114-11	10/20/15 10:28	100	100
PBWPM	5101915-BLK1	10/20/15 10:28	100	100
MLCSPM	5101915-BS1	10/20/15 10:28	100	100
16WC1AD	5101915-DUP1	10/20/15 10:28	100	100
16WC1AS	5101915-MS1	10/20/15 10:28	100	100
16WC1ASD	5101915-MSD1	10/20/15 10:28	100	100

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ANALYSIS DATA SHEET

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-01 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-39-3	Barium	239	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:35
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-48-4	Cobalt	5.38	0.00950	5.00	1		EPA 6020A	5J23003	10/23/15 14:35
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:35
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:35
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:04
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:35
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:35

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ANALYSIS DATA SHEET

16C1

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-02 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-39-3	Barium	201	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:45
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:45
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:15
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:45
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:45

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ANALYSIS DATA SHEET

16MW8

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-03 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-39-3	Barium	141	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:47
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-50-8	Copper	10.9	0.120	5.00	1		EPA 6020A	5J23003	10/23/15 14:47
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:47
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:17
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:47
7440-66-6	Zinc	31.1	0.120	10.0	1		EPA 6020A	5J23003	10/23/15 14:47

Liberty Analytical

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ANALYSIS DATA SHEET

16MW9

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-04 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-39-3	Barium	554	0.200	20.0	2	D	EPA 6020A	5J23003	10/23/15 16:00
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:52
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:20
7440-02-0	Nickel	15.3	0.00910	10.0	1		EPA 6020A	5J23003	10/23/15 14:52
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:52
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:52

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16WDUP

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-05 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-39-3	Barium	240	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:54
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-48-4	Cobalt	5.91	0.00950	5.00	1		EPA 6020A	5J23003	10/23/15 14:54
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:54
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:54
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:22
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:54
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:54

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ANALYSIS DATA SHEET

16WC1B

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-06 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-39-3	Barium	145	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:55
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-48-4	Cobalt	17.0	0.00950	5.00	1		EPA 6020A	5J23003	10/23/15 14:55
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:55
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:55
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:31
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:55
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:55

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16-2

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-07 % Solid: Matrix: Water Sampled: 10/14/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-39-3	Barium	231	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 14:57
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:57
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:33
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:57
7440-66-6	Zinc	14.1	0.120	10.0	1		EPA 6020A	5J23003	10/23/15 14:57

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16-3

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-08 % Solid: Matrix: Water Sampled: 10/13/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-39-3	Barium	755	0.200	20.0	2	D	EPA 6020A	5J23003	10/23/15 16:04
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 14:59
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:36
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 14:59
7440-66-6	Zinc	12.9	0.120	10.0	1		EPA 6020A	5J23003	10/23/15 14:59

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16-5

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-09 % Solid: Matrix: Water Sampled: 10/13/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-39-3	Barium	182	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 15:00
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:00
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:39
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:00
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:00

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16WC2B

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-10 % Solid: Matrix: Water Sampled: 10/13/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-39-3	Barium	120	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 15:02
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:02
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:41
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:02
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:02

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ANALYSIS DATA SHEET

16SPRING

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Lab ID: 1510114-11 % Solid: Matrix: Water Sampled: 10/13/15 Received: 10/16/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic		0.140	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-39-3	Barium	219	0.100	10.0	1		EPA 6020A	5J23003	10/23/15 15:04
7440-41-7	Beryllium		0.0330	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-43-9	Cadmium		0.0110	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-47-3	Chromium		0.0680	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-48-4	Cobalt		0.00950	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-50-8	Copper		0.120	5.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7439-92-1	Lead		0.0210	1.00	1	U	EPA 6020A	5J23003	10/23/15 15:04
7439-97-6	Mercury		0.200	2.00	1	U	EPA 7470A	5J21014	10/21/15 12:44
7440-02-0	Nickel		0.00910	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-62-2	Vanadium		0.0560	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:04
7440-66-6	Zinc		0.120	10.0	1	U	EPA 6020A	5J23003	10/23/15 15:04

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BLANKS

EPA 7470A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Sequence: 5J21014 Instrument ID: V4

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5J21014-ICB1	Mercury	-0.00900	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5J21014-CCB1	Mercury	-0.0200	0.200	2.00	ug/L	*U*	EPA 7470A
PBWPM	5101915-BLK1	Mercury		0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5J21014-CCB2	Mercury	-0.00800	0.200	2.00	ug/L	*U*	EPA 7470A
CCB	5J21014-CCB3	Mercury	-0.00700	0.200	2.00	ug/L	*U*	EPA 7470A

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BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Sequence: 5J23003 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5J23003-ICB1	Arsenic	-0.0184	0.140	10.0	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Barium	0.000860	0.100	10.0	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Beryllium	-0.00149	0.0330	1.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Cadmium	0.00149	0.0110	1.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Chromium	0.00642	0.0680	5.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Cobalt	0.00229	0.00950	5.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Copper	0.00197	0.120	5.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Lead	0.00684	0.0210	1.00	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Nickel	-0.00126	0.00910	10.0	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Vanadium	0.00873	0.0560	10.0	ug/L	U	EPA 6020A
ICB	5J23003-ICB1	Zinc	0.0166	0.120	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Arsenic	-0.0154	0.140	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Barium	0.00212	0.100	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Beryllium	0.000280	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Cadmium	0.00300	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Chromium	0.000110	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Cobalt	0.00404	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Copper	0.0113	0.120	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Lead	0.00368	0.0210	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Nickel	0.00659	0.00910	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Vanadium	0.00229	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB1	Zinc	0.0262	0.120	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Arsenic	-0.0151	0.140	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Barium	0.0125	0.100	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Beryllium	0.00571	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Cadmium	0.00537	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Chromium	-0.0150	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Cobalt	0.00781	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Copper	0.0114	0.120	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Lead	0.0150	0.0210	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Nickel	0.00676	0.00910	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Vanadium	0.00565	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB2	Zinc	0.0327	0.120	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Arsenic	0.0133	0.140	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Barium	0.00660	0.100	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Beryllium	0.00189	0.0330	1.00	ug/L	U	EPA 6020A

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BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Sequence: 5J23003 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5J23003-CCB3	Cadmium	0.00880	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Chromium	-0.0198	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Cobalt	0.00671	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Copper	0.0159	0.120	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Lead	0.00717	0.0210	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Nickel	0.0122	0.00910	10.0	ug/L	J	EPA 6020A
CCB	5J23003-CCB3	Vanadium	-0.00186	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB3	Zinc	0.0575	0.120	10.0	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Arsenic		0.140	10.0	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Barium		0.100	10.0	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Beryllium		0.0330	1.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Cadmium		0.0110	1.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Chromium		0.0680	5.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Cobalt		0.00950	5.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Copper		0.120	5.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Lead		0.0210	1.00	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Nickel		0.00910	10.0	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Vanadium		0.0560	10.0	ug/L	U	EPA 6020A
PBWPL	5101914-BLK1	Zinc		0.120	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Arsenic	-0.00718	0.140	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Barium	0.00257	0.100	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Beryllium	-0.00564	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Cadmium	0.00190	0.0110	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Chromium	-0.0508	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Cobalt	0.00336	0.00950	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Copper	0.00927	0.120	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Lead	0.00275	0.0210	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Nickel	0.00853	0.00910	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Vanadium	-0.0127	0.0560	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB4	Zinc	0.0283	0.120	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB5	Arsenic	0.00484	0.140	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB5	Barium	0.0273	0.100	10.0	ug/L	U	EPA 6020A
CCB	5J23003-CCB5	Beryllium	0.00853	0.0330	1.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB5	Cadmium	0.0287	0.0110	1.00	ug/L	J	EPA 6020A
CCB	5J23003-CCB5	Chromium	0.0202	0.0680	5.00	ug/L	U	EPA 6020A
CCB	5J23003-CCB5	Cobalt	0.0196	0.00950	5.00	ug/L	J	EPA 6020A

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BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1510114 Project: RAAP 2013+ UNIT 16 & 10/B03204-13A

Sequence: 5J23003 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
CCB	5J23003-CCB5	Copper	0.0298	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB5	Lead	0.0172	0.0210	1.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB5	Nickel	0.0263	0.00910	10.0	ug/L	*J*	EPA 6020A
CCB	5J23003-CCB5	Vanadium	0.0224	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB5	Zinc	0.0807	0.120	10.0	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Arsenic	-0.0181	0.140	10.0	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Barium	0.0139	0.100	10.0	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Beryllium	0.00794	0.0330	1.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Cadmium	0.0122	0.0110	1.00	ug/L	*J*	EPA 6020A
CCB	5J23003-CCB6	Chromium	-0.00137	0.0680	5.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Cobalt	0.0113	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5J23003-CCB6	Copper	0.0183	0.120	5.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Lead	0.0126	0.0210	1.00	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Nickel	0.0165	0.00910	10.0	ug/L	*J*	EPA 6020A
CCB	5J23003-CCB6	Vanadium	0.00949	0.0560	10.0	ug/L	*U*	EPA 6020A
CCB	5J23003-CCB6	Zinc	0.0546	0.120	10.0	ug/L	*U*	EPA 6020A

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12/10/2015

Abridged data package. Full deliverable available.

JANET FRAZIER

DRAPER ADEN ASSOCIATES

2206 SOUTH MAIN STREET

BLACKSBURG, VA 24060

Subject:

Report of Data - Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

WorkOrder: 1512018

Attn.: JANET FRAZIER

Enclosed are the results of analytical work performed in accordance with the referenced account number. This report covers sample(s) appearing on the listing.

Thank you for selecting CompuChem for your sample analysis. If you should have questions or require additional analytical services, please contact your representative at 1-800-833-5097

Sincerely,

Compuchem

a division of Liberty Analytical Corporation

Attachment

TOTAL NUMBER

OF PAGES _____

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

CompuChem, a division of Liberty Analytical

Client: DRAPER ADEN ASSOCIATES **Work:** 1512018

Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A **Sdg:** 1512018

Lab ID	Client ID	Matrix	Date Sampled	Date Received
1512018-01	16WC1A	Water	12/04/2015 10:05	12/05/2015 09:19

ANALYSES DATA PACKAGE COVER PAGE

Client: DRAPER ADEN ASSOCIATES

Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Laboratory: Liberty Analytical

SDG: 1512018

Client Sample Id:	Analysis:	Lab Sample Id:
16WC1A	EPA 6020A	1512018-01

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions addressed in the narrative. Release of the data contained in this hardcopy data package and in the Electronic Data Deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan W Bass Name: Susan Bass

Date: 12/09/2015 Title: Chemist III

Liberty Analytical

ACCREDITED IN ACCORDANCE WITH nelac

501 Madison Avenue, Cary, NC 27513 Tel: 919-379-4100 Fax: 919-379-4050

A. SDG Narrative

Liberty Analytical Corp.
501 Madison Avenue
Cary, NC 27513

SDG NARRATIVE
SDG # 1512018
Client: DRAPER ADEN ASSOCIATES
Project: RAAP 2015 UNIT 16/Co only-5day/B03204-13A

The indicated Sample Delivery Group (SDG) consisting of one (1) water sample was received into the laboratory information management system (LIMS) on December 5, 2015 intact and in good condition with the Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The sample's temperature was 1.1 degrees Celsius. Temperature was recorded by IR temperature gun.

The sample was prepared and analyzed in accordance with SW846 6020A methodology for the requested metal cobalt.

EQUATIONS FOR LIQUID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in µg/L as presented on Analysis Data Sheet data sheets from ICP/MS instrument acquired results in µg/L (ppb).

$$\frac{C \times F}{I}$$

Where

C = concentration (µg/L)

F = final volume in liters after sample preparation

I = initial volume in liters

Example: Cobalt for sample 16WC1A

$$\frac{6.77854\ \mu g/L\ (C) \times 0.05\ L\ (F)}{0.05\ L\ (I)} = 6.779\ \mu g/L \text{ reported as } 6.78\ \mu g/L$$

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (LLICV, LLCCV, ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 methodology.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and the field sample was prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The ICP/MS sample matrix spike, CCN = 5120701-MS1 (16WC1AS) was found to be inside control limits.

The ICP/MS sample matrix duplicate spike, CCN = 5120701-MSD1 (16WC1ASD) was found to be inside control limits.

The ICP/MS sample duplicate, CCN = 5120701-DUP1 (16WC1AD) was found to be inside control limits.

A five-fold serial dilution of sample, CCN = SDI1512018-01 (16WC1AL) was performed in accordance with SW-846 requirements for ICP/MS analysis.

The adjusted sample concentration was inside control limits.

The ICP/MS sample post digestion spike, CCN =5120701-PS1 (16WC1AA) was performed and passed criteria.

I certify that the tests used in this report meet all requirements of the NELAC standards unless otherwise stated in the SDG narrative or QA notice.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on CD has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Susan W Bass

Susan W. Bass
Senior Chemist
December 9, 2015

Liberty Analytical

Liberty Analytical's Pagination Convention

As required by the EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is Liberty Analytical's policy to add an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.). This policy is also applicable to non-CLP data packages.

Revision 7 (01/12/2011)

Liberty Analytical

INORGANIC DATA REPORTING QUALIFIERS

On the appropriate reporting form, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. In the absence of specific qualifiers in the analytical method requested, the laboratory utilizes EPA CLP qualifiers. The qualifiers used are:

U : This flag indicates the compound was analyzed for, not detected and is reported as less than the Method Detection Limit (MDL) (or as defined by the client). The Reporting Limit (RL), or Limit of Quantitation (LOQ), and the MDL will be adjusted to reflect any dilution or concentration of the sample and, for soils, the percent moisture.

J : This flag indicates the reported result is an estimated value. The flag is used when an analyte is detected and the result is less than the adjusted RL/LOQ but equal to or greater than the MDL.

Q : This flag denotes that one or more quality control criteria have failed (e.g., LCS recovery, Continuing Calibration Verification, CCV, and interference check standards for ICP-AES/ICP-MS) and reanalyses can't be performed. The Q flag is applied to all specific analyte(s) in all samples associated with the failed quality control criteria.

B : This flag is used when the analyte is found in the associated method or calibration blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

D: This flag is applied to an analyte when the reported result is based on a dilution.

* This flag is applied to a target analyte when any QC acceptance criterion has not been met for that analyte. The flag appears on the reporting form of the associated QC analysis. The flag is applied if matrix spike recoveries are out of control limits and the sample result is ≤ 4X the spike added. The flag is also applied if duplicates are out of control. If both sample and duplicate values are ≥ 5X RL, then the RPD must be ≤ 20%. If either value (sample or duplicate) is < 5X RL, the absolute difference between the values has to be < CRQL to be in control. This flag is also applied to outliers in the serial dilution test. Any analytes with a sufficiently high concentration (minimally 10X RL after a 1:5 dilution) will have the flag applied if the dilution analysis doesn't agree within ± 10% of the original determination.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

The extensions: D, S, SD, L, and A are added to the end of the Client ID and represent the following:

D – Matrix Duplicate
S – Matrix Spike
SD – Matrix Spike Duplicate
L – Serial Dilution
A – Post Digestion Spike

Revision 3 (08-11-2015)

Chain of Custody Records

The laboratory shall include a copy of the Chain-of-Custody (CoC) documentation for all of the samples in the Work Order/SDG.

CHAIN OF CUSTODY RECORD

Laboratory: CompuChem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

AT 12/1/15

Client:	0	**Consultant:**	Draper Aden Associates	**Sample Site:**	RAAP, Radford, Virginia
Attn:	0	**Attn:**	Janet C. Frazier	**Location:**	HWMU16
Address:	0 0	**Address:**	2206 South Main Street Blacksburg, Virginia 24060	**Event:**	2015 Verification Monitoring Event
Phone:	0	**Phone:**	(540) 552-0444	**DAA JN:**	B03204-13A
Fax:	0	**Fax:**	(540) 552-0291	**Lab JN:**	
Fax:	0				

Project Specific (PS) or Batch (B) QC:
Sample Collection for Project Complete? YES
UPS: 12-237-301-44-9634-0692
Carrier:
Tracking Number:

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; AG Amber Glass; V VOA; CG Clear Glass

Invoice
Copy to Consultant: YES
Bill: CLIENT OTHER
Preserved and shipped on Ice: YES

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample					<2								
Box 2 - Preservative					B								
Box 5 - Sample Container Type					1-250 ml P								
Sample ID	**Date: 2015**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**Total Metals - 6020A (Cobalt ONLY)**	metals plt							
16WC1A	12/04	1005	GW	1	X	42		15	2018-01				

GENERAL NOTES:
1. DAA EDD required.
2. Level 4 deliverables required.
3. Report ~~results at or above~~ project QL = 5 mg/L

Need results ASAP, if possible. JWR 12.1.2015

Clients Special Instructions: 1,1 CRA 12/5/15

Received by lab in Good Condition X Yes ____ No Custody Seal Intact X Yes ____ No Temperature upon arrival ~~7.0~~ Received on Ice X Yes ____ No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 12/04/15	#1 Relinquished by (Signature):	Date: 12/4/15	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0730	Company Name: DAA	Time: 1300	Company Name:	Time:	
Sampler Name (Print): Will Mason-Deese	Date: 12/04/15	#1 Received by (Signature):	Date: 12/5/15	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0730	Company Name: CompuChem	Time: 0919	Company Name:	Time:	

1/1 AT 12/1/15

1512018

Liberty Analytical

Client:	**DRAPER ADEN ASSOCIATES**	**Project Manager:**	**Cathy Dover**
Project:	**RAAP 2015 UNIT16/Co only-5day/B03204-13A**	**Project Number:**	**RAAP 2015 UNIT16/Co only-5day/B03204-13A**
SDG:	**1512018** **CASE:**	**Status:**	**Reported**

Report To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone: (540) 552-0444
Fax: -

Invoice To:

DRAPER ADEN ASSOCIATES
JANET FRAZIER
2206 SOUTH MAIN STREET
BLACKSBURG, VA 24060
Phone :(540) 552-0444
Fax: -

Date Due:	12/10/2015 00:00 (5 day TAT)		
Received By:	Cathy Dover	Date Received:	12/05/2015 09:19
Logged In By:	Cathy Dover	Date Logged In:	12/06/2015 21:34

J & B Flags?: **YES**	TICS?: **NO**	Deliverable: **Level 4**	EDD : **DRAPER ACCESS + ERIS**
Metals ND to? **MDL**	Spike Level: **FULL Spike**		

USE 1512017-01 FOR QC*6020A MTL =Co ONLY*RESULTS DUE BY THURSDAY 12/10/15

Analysis	Due	TAT	Expires	Received	Comments
1512018-01 16WC1A [Water] Sampled 12/04/2015 10:05 Eastern					**USE FOR QC**
6020A ICP MS (UPDATE IV)	12/10/2015 16:00	5	06/01/2016 10:05	12/05/2015 09:19	

METHOD DETECTION AND REPORTING LIMITS

Laboratory: Liberty Analytical **SDG:** 1512018

Client: DRAPER ADEN ASSOCIATES **Project:** RAAP 2015 UNIT16/Co only-5day/B03204-13A

Matrix: Water **Instrument:** PEMS

Analyte	MDL	RL	Units	Method
Cobalt	0.0095	5.00	ug/L	EPA 6020A

LCS / LCS DUPLICATE SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 5120701-BS1 Matrix: Water Client ID: MLCSSG Batch: 5120701

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	119	108		80 - 120

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1AS

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 5120701-MS1 % Solid: NA Matrix: Water Lab Source ID: 1512018-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Cobalt	110.0	6.78	113	96.8		75 - 125

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 6020A

16WC1ASD

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 5120701-MSD1 % Solid: NA Matrix: Water Lab Source ID: 1512018-01 Source Sample: 16WC1A

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Cobalt	110.0	117	100	3.23		20	75 - 125

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SERIAL DILUTION

EPA 6020A

16WC1AL

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 5L08001-SRD1 Matrix: Water Lab Source ID: 1512018-01 Source Sample: 16WC1A

Sequence: 5L08001 Dilution: 5 Report to MDL: YES

Analyte	Initial Sample Result (I)	Serial Dilution Result (S)	RL	% Difference	Q	Method	QC Limits % Difference
Cobalt	6.78	7.17 J	5.00	5.80		EPA 6020A	10

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DUPLICATES

EPA 6020A

16WC1AD

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 5120701-DUP1 % Solid: NA Matrix: Water Lab Source ID: 1512018-01 Source Sample: 16WC1A

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (ug/L)	DUPLICATE CONCENTRATION (ug/L)	RPD %	Q	METHOD
Cobalt	20	*6.78*	6.90	1.73		EPA 6020A

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PREPARATION BATCH SUMMARY

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Batch: 5120701 Matrix: Water Preparation: EPA 3005A

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL/WT (mL)	FINAL VOL/WT (mL)
16WC1A	1512018-01	12/07/15 08:10	50.0	50.0
PBWSG	5120701-BLK1	12/07/15 08:10	50.0	50.0
MLCSSG	5120701-BS1	12/07/15 08:10	50.0	50.0
16WC1AD	5120701-DUP1	12/07/15 08:10	50.0	50.0
16WC1AS	5120701-MS1	12/07/15 08:10	50.0	50.0
16WC1ASD	5120701-MSD1	12/07/15 08:10	50.0	50.0
16WC1AA	5120701-PS1	12/07/15 08:10	50.0	50.0

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ANALYSIS DATA SHEET

16WC1A

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Lab ID: 1512018-01 % Solid: Matrix: Water Sampled: 12/04/15 Received: 12/05/15

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-48-4	Cobalt	6.78	0.00950	5.00	1		EPA 6020A	5L08001	12/8/15 11:06

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BLANKS

EPA 6020A

Client: DRAPER ADEN ASSOCIATES SDG: 1512018 Project: RAAP 2015 UNIT16/Co only-5day/B03204-13A

Sequence: 5L08001 Instrument ID: PEMS

Client ID	Lab Sample ID	Analyte	Found	MDL	RL	Units	Q	Method
ICB	5L08001-ICB1	Cobalt	0.0209	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5L08001-CCB1	Cobalt	0.00332	0.00950	5.00	ug/L	*U*	EPA 6020A
PBWSG	5120701-BLK1	Cobalt		0.00950	5.00	ug/L	*U*	EPA 6020A
CCB	5L08001-CCB2	Cobalt	0.0177	0.00950	5.00	ug/L	*J*	EPA 6020A
CCB	5L08001-CCB3	Cobalt	0.0185	0.00950	5.00	ug/L	*J*	EPA 6020A

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Data Validation Report

Draper Aden Associates
Engineering • Surveying • Environmental Services

Draper Aden Associates
Engineering • Surveying • Environmental Services
www.daa.com

Data Validation Summary
Fourth Quarter 2015
Semiannual Groundwater Monitoring Event for HWMU 16 and
Corrective Action Semiannual Groundwater Monitoring Event for HWMU 5

Post Closure Care Permit Hazardous Waste Management Units 5 and 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID# VA1210020730

Draper Aden Associates performed data validation of the analytical results for the Fourth Quarter 2015 semiannual groundwater monitoring event at Hazardous Waste Management Unit (HWMU) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. Groundwater monitoring activities were conducted in accordance with the *Final Hazardous Waste Management Post-Closure Care Permit* (Permit) for HWMUs 5 and 16 (original effective date October 4, 2002, reissued August 16, 2014 and VDEQ approved Class 1 Permit Modification dated September 12, 2014). The Fourth Quarter 2015 event served as the twelfth semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with the Permit. The following information summarizes the findings of the Fourth Quarter 2015 semiannual activities at each Unit. Additionally, no groundwater sampling was conducted at HWMU-7 or at HWMU-10 during Fourth Quarter 2015; the VDEQ issued approval of clean closure for groundwater with immediate cessation of groundwater post-closure related activities for both Units in correspondence dated June 26, 2013 (HWMU-7) and dated April 2, 2014 (HWMU-10).

Sample Collection/Analytical Services

Draper Aden Associates, of Blacksburg, Virginia, collected groundwater samples during October 13 through October 20, 2015. Samples were submitted for laboratory analysis via courier to CompuChem, a Division of Liberty Analytical (CompuChem), of Cary, North Carolina; or Eurofins Lancaster Laboratories Environmental, LLC (ELLE), of Lancaster, Pennsylvania. A summary table of the required analyses and identification of the analyzing laboratory is provided below. Each laboratory is a VELAP accredited laboratory for the analytes, methods, and matrix as listed on each certificate of analysis, except if noted below.

Verification Event

Draper Aden Associates, of Blacksburg, Virginia collected a groundwater sample and duplicate for HWMU-16 on December 4, 2015 for a verification monitoring event. The samples (16WC1A and 16WDUP) were analyzed for Method 6020A (cobalt only). Samples were submitted for laboratory analysis via courier to CompuChem, a Division of Liberty Analytical (CompuChem), of Cary, North Carolina. The verification result for cobalt was greater than the Groundwater Protection Standard (GPS). The January 5, 2016 correspondence from DEQ to BAE SYSTEMS, Ordnance Systems, Inc (BAE) directed the facility to submit a combined alternate source demonstration (ASD) to DEQ for cobalt for 16WC1A and 16WC1B.

Receipt of Monitoring Event Data

On behalf of BAE, each laboratory submitted results to Draper Aden Associates in a final certificate of analysis which included analytical results as well as relevant documentation to verify and validate the results as discussed below. The final certificate of analysis for this event was received November 19, 2015. The verification results were received January 6, 2016.

Summary of Monitoring Event Data by Analytical Method

Certificates of analysis were received from each laboratory in the following sample delivery groups (SDGs):

Summary of Required Analytical Methods and SDGs

Analytical Method	Hazardous Waste Management Unit (HWMU)		Laboratory
	HWMU 5	HWMU 16	
8260C Volatiles	RAE50	RAE46	ELLE
8270D Semivolatiles	NA	1510114	CompuChem
6020A Inorganics	1510132	1510114 / 1512018 (verification)	CompuChem
7470A Mercury	NA	1510114	CompuChem

NA - Denotes analysis not applicable/analysis not required.

Each final certificate of analysis was complete in its presentation and the data were of acceptable quality. Chains of custody and permit required target analyte lists are provided in each SDG.

Data Analysis and Validation

Samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA, III and subsequent updates).* Data, except where noted below, were evaluated in accordance with:

- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review,* June 2008.
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004 *and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,* January 2010, where applicable.
- *USEPA Region III Innovative Approaches for Validation of Organic and Inorganic Data Standard Operating Procedures M-1 and IM-1,* June 1995, modified, and the analytical method.

Draper Aden Associates, of Blacksburg, Virginia, performed data validation as detailed in the attached data validation reports. For each HWMU, data validation reports and a summary table of data validation results are provided as an attachment. (Appendix A – data validation summary tables, Appendix B – data validation reports and laboratory data).

Review was limited to the following items, where applicable:

- Data package completeness
- Chain of custody
- Holding time/preservation
- Initial and continuing calibrations
- Blanks
- Interference check sample (inorganics)
- Surrogates
- Matrix spike/matrix spike duplicate/(MS/MSD) samples
- Laboratory control samples (LCS)
- Internal standards
- Field duplicate
- Laboratory duplicate (inorganics)
- Serial dilution (inorganics)
- Target analyte identification and quantitation
- Other – as noted

Reporting of Results

For HWMU 5, results were reported to at or above the laboratory method detection limit (MDL). The MDL was at or below the permit detection limit and permit quantitation limit (QL) listed in Appendix J or Module VI-Groundwater Corrective Action & Monitoring Program for Unit 5. Results reported between the MDL and QL should be considered estimated concentrations.

For this event, point of compliance well and plume well results for HWMU 16 were reported to at or above the permit QL, except where noted.

Summary of Data Validation Results

The data validation results are summarized below and on the attached reports and table. Each final certificate of analysis was complete in its presentation and the data were of acceptable quality. The chain of custody documentation was complete. The laboratory received the samples on ice and in good condition, with custody seals intact. Technical holding time and preservation criteria were met. The data set demonstrated the laboratory's ability to achieve the permit QL, unless noted below.

SW-846 Method 8260C/5030C-Volatile Organic Analytes- 25 ml purge volume

Instrument calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/blind field sample duplicate results, and target analyte identification and quantitation were met, except where noted below. The MS/MSD samples were analyzed on project samples as noted on the chain of custody. A trip blank was analyzed for each day of sample collection. A blind field duplicate was collected and analyzed for the required target analytes. No target analytes were detected in the sample/field duplicate sample unless noted below. Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

HWMU 5

- Sample/Blind Field Sample Duplicate results - 5WC21/5WDUP - Trichloroethene was reported above the QL in both the sample and blind field duplicate (2.9/3.4 µg/l). The RPD criteria were met.
- Vinyl chloride did not meet the % difference/drift requirement (%D) of ±20%. Vinyl chloride was not detected at or above the detection limit or QL in any sample and sample results were validated and qualified "UJ" to note that the DL and QL were estimated due to the observed QC deficiency. The remaining CV criteria were met.

HWMU 16

- The bottle quantity listed on the COC was three for each of the trip blanks; however, the laboratory received only two bottles per trip blank and no data qualification was required.
- Sample/Blind Field Sample Duplicate results – 16WC1A/16WDUP - 1,1-dichloroethane (1.85/1.91 µg/l) and diethyl ether (15.62/15.66 µg/l) were reported above the QL in both the sample and blind field duplicate. The RPD criteria were met.
- Samples 16C1 and 16MW9 were analyzed in dilution to obtain the final result for diethyl ether.
- Diethyl ether recovered low in the MS/MSD. Sample results not detected for diethyl ether were validated and qualified "UJ" to note that the QL was estimated due to the observed QC deficiency. Results for diethyl ether above the QL were reported as estimated. The remaining MS/MSD criteria were met.
- The laboratory inadvertently omitted analyzing dimethyl ether by 25 ml purge volume against a calibration curve. The laboratory reported the dimethyl ether results as a tentatively identified compound (TIC) using library search. Dimethyl ether was not detected and results for dimethyl ether were qualified as estimated to note the QL is estimated due to this discrepancy (see revision section of this report for laboratory explanation).
- The permit required QL is 12.5 µg/l for both diethyl ether and dimethyl ether. The laboratory reported the QL as 13 µg/l for diethyl ether and 13 µg/l estimated (estimated due to reporting by TIC) for dimethyl ether using due to the laboratory rounding policy. Draper Aden Associates revised the QL to 12.5 µg/l and no revision was requested.

SW-846 Method 8270D/3510C- Semivolatile Organic Analytes

Calibration, blank, surrogate, MS/MSD, LCS, internal standards, sample/field sample duplicate results, and target analyte identification and quantitation criteria were met. The MS/MSD samples were analyzed on project samples as noted on the chain of custody. No target analytes were detected at or above the permit QL in the sample/field duplicate sample. Deviations from specific QA/QC criteria that were identified during the data review process are summarized below.

HWMU 16

- A footnote presented in Appendix G to Attachment 3, Groundwater Corrective Action Annual Monitoring List, of Permit Module V – *Groundwater Compliance Monitoring for Unit 16* indicates that verification is required for constituents detected at concentrations less than the Limit of Quantitation (LOQ)/QL if their associated groundwater protection standard (GPS) is based on the LOQ/QL. This footnote applies to 2,4-dinitrotoluene and 2,6-dinitrotoluene detected below the LOQ/QL only in compliance wells.

During Fourth Quarter 2015, 2,4-dinitrotoluene and 2,6-dinitrotoluene were not detected at or above the MDL or QL and no additional evaluation was required.

SW-846 Method 6020A/3005A–Inorganics-total

Calibration, blank, interference check sample, MS/MSD/DUP, LCS, internal standards, serial dilution, sample/field sample duplicate results, and target analyte quantitation were met, except where noted below or no data qualification was required. MS/MSD analyses were performed on project samples as noted on the chain of custody. Deviations from specific QA/QC criteria that were identified during the data review process are summarized below. The field duplicate/sample results exhibited acceptable precision, where applicable.

HWMU 5

- Sample/Blind Field Sample Duplicate results – 5WC21/5WDUP – Cobalt was reported above the QL in both the sample and blind field duplicate (75.2/72.6 µg/l). The RPD criteria were met.

HWMU 16

- Sample/Blind Field Sample Duplicate results – 16WC1A/16WDUP – Barium (239/240 µg/l) and cobalt (5.38/5.9 µg/l) were reported above the QL in both the sample and blind field duplicate. The RPD criteria were met.
- Samples 16-3 and 16MW9 were analyzed in dilution to obtain the final result for barium.
- Cobalt was detected above the QL in sample 16WC1A and 16WDUP. A verification event to confirm or refute the detections was performed on December 4, 2015 and samples were sent to CompuChem (as noted above). The verification event results confirmed the original cobalt results and the original results for 16WC1A and 16WDUP were reported as the final results.

SW-846 Method 7470A– Mercury-total - (HWMU 16 only)

Calibration, blank, MS/MSD, LCS, sample/field sample duplicate results were within control limits. MS/MSD analyses were performed on project samples as noted on the chain of custody. Mercury was not detected in the sample/blind field duplicate sample. No deviations from specific QA/QC criteria were identified during the data review process.

A. QC DELIVERABLES PACKAGE – SAMPLE PAPERWORK:

1.	Was the chain of custody included in the data deliverable package?	☑ YES ☐ NO
2.	Was custody transfer between different parties dated and signed?	☑ YES ☐ NO
3.	Did the chain of custody document sampler signature, sample locations, date and time of sampling and analyses requested?	☑ YES ☐ NO
4.	Were the sample results included for each sample location?	☑ YES ☐ NO
5.	Did the laboratory report the required target analytes?	☑ YES ☐ NO

End of page

DATA EVALUATION FOR SW-846 METHOD 8260C (GC/MS) VOLATILE ORGANICS

A. QC DELIVERABLES PACKAGE:

- ☑ Project specific target analytes reported at or above required permit QL
  MDL study performed for target analytes and supports required QL-not reviewed
- ☑ VELAP accredited

B. TECHNICAL HOLDING TIME AND PRESERVATION REVIEW CRITERIA:

- ☑ 14-day sample holding time, pH <2
- ☑ Samples received at ≤6ºC, zero headspace
- ☑ Preparation Method 5030C, 25 ml purge volume

C. GC/MS INSTRUMENT PERFORMANCE CHECK REVIEW CRITERIA:

- ☑ Instrument performance check solution was analyzed at the beginning of each 12-hour period of standard and/or sample analysis

D. INITIAL GC/MS CALIBRATION REVIEW CRITERIA:

- ☑ Target analytes included in the ICAL
- ☑ ICAL consisted of 5 calibration standards (or more, as needed)
- ☑ Lowest concentration calibration standard at or below the associated MCL, regulatory compliance, action limit, or required QL
- ☑ No calibration standards were removed from curve that would negatively impact the data integrity
- ☑ Each target analyte %RSD ≤ 20%
- ☑ Correlation coefficient or coefficient of determination >0.99 for target analytes with ≥ 20% RSD
- ☑ Initial calibration verification analytes have % Difference/Drift within ± 30.0%

E. CALIBRATION VERIFICATION REVIEW CRITERIA:

- ☑ Calibration verification standard analyzed at the beginning of each 12-hour period following the instrument performance check analysis and prior to the method blank and sample analysis
- ☑ % Difference/Drift of target analytes within ± 20%

F. BLANK REVIEW CRITERIA:

- ☑ Method/extraction blank analyzed on each GC/MS system used for sample analysis
- ☑ Trip Blank-one per day of collection.

G. SURROGATE REVIEW CRITERIA:

- ☑ The following surrogates (or others as allowed) were used and within the specified range
  - dibromofluoromethane (77-114%), 4-bromofluorobenzene (78-110%)
  - toluene-d_8 (77-110%), 1,2-dichloroethane-d_4 (74-113%)

H. MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) / LABORATORY CONTROL SAMPLE (LCS) REVIEW CRITERIA:

- ☑ MS/MSD and LCS analyzed; MS/MSD and LCS within range
- ☑ Project specific analytes -%R 70-130%, RPD ≤20
- ☑ Independent source

I. INTERNAL STANDARDS REVIEW CRITERIA:

- ☑ The following internal standards (or others as allowed) were used
  -t-butyl alcohol-d_{10}, fluorobenzene, chlorobenzene-d_5, 1,4-dichlorobenzene-d_4
- ☑ Internal standard areas within ± 50% of last calibration verification
- ☑ Internal standard retention times within ± 30 seconds of last calibration verification

J. TARGET ANALYTE IDENTIFICATION REVIEW CRITERIA:

- ☑ Results were consistent with historical data. New detections evaluated as follows:
- ☑ RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT
- ☑ Sample spectra versus laboratory standard spectra criteria were evaluated:
  -Characteristic ions maximized in the same scan or within one scan of each other
  -Characteristic ions present in the standard spectra were present in the sample spectra for analytes detected above the QL
  -Relative intensities of the ions between the standard and sample spectra were within ±30%.

K. TARGET ANALYTE QUANTITATION REVIEW CRITERIA:

- ☑ Results are consistent with historical data. New detections evaluated as follows:
  - If analyte %RSD was 20% or less, use average relative response factor for quantitation.
  - If analyte %RSD was greater than 20%, use first or higher order regression fit of five calibration points (6 calibration points for 2nd order)
- ☑ Results that exceed the initial calibration range were reanalyzed at a higher dilution
- ☑ Analyte concentrations recorded on the sample quantitation reports were accurately transferred to the sample summary sheets (laboratory report)

L. REPORTING:

- ☑ Detected analytes or results requiring validation are presented on the attached data validation report
- ☑ Results reported at or above permit QL (HWMU16)
- ☑ Results reported at or above permit DL and QL (HWMU5)
- ☑ Results reported within instrument calibration range, except as noted
- ☑ Dimethyl ether was reported by the laboratory as TIC, QL estimated (see revision section of report)
- ☑ Sample/blind field duplicate RPD <20, where applicable

A. QC DELIVERABLES PACKAGE:

- ☑ VELAP accredited
- ☑ Electronic data file reviewed

B. TECHNICAL HOLDING TIME AND PRESERVATION REVIEW CRITERIA:

- ☑ Holding time: 7-day sample collection to extraction / 40-day extraction to analysis
- ☑ Samples received at ≤6ºC
- ☑ Extraction Method 3510C used

C. GC/MS INSTRUMENT PERFORMANCE CHECK REVIEW CRITERIA:

- ☑ Instrument performance check solution analyzed at the beginning of each 12-hour period of standard and/or sample analysis

D. INITIAL GC/MS CALIBRATION REVIEW CRITERIA:

- ☑ Target analytes included in the ICAL
- ☑ ICAL consisted of a minimum of 5 calibration standards (or more, as needed)
- ☑ Lowest concentration calibration standard at or below the associated MCL, regulatory compliance, action limit, or permit QL
- ☑ No calibration standards were dropped to meet calibration criteria
- ☑ Each target analyte RSD ≤ 20%
- ☑ Correlation coefficient or coefficient of determination >0.99 for target analytes with ≥20 % RSD
- ☑ Initial calibration verification analytes have % Difference/Drift within ± 30.0%

E. CALIBRATION VERIFICATION REVIEW CRITERIA:

- ☑ Calibration verification standard analyzed at the beginning of each 12-hour period following the instrument performance check analysis and prior to the method blank and sample analysis
- ☑ Analytes have % Difference/Drift within ± 20.0%

F. BLANK REVIEW CRITERIA:

- ☑ Method/extraction blank analyzed on each GC/MS system used for sample analysis

G. SURROGATE REVIEW CRITERIA:

- ☑ The following surrogates (or others, as allowed) were used and within the specified range
  - phenol - d_6 (10-94%), - 2-fluorophenol (21-100%), - 2,4,6-tribromophenol (10-123%),
  - nitrobenzene – d_5 (43-108%), - 2-fluorobiphenyl (43-116%), - terphenyl - d_{14} (33-141%)
  - For this event, only the three base surrogates were used and no data qualification was required.

H. MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) / LABORATORY CONTROL SAMPLE (LCS) REVIEW CRITERIA:

- ☑ MS/MSD and LCS analyzed with target analytes
- ☑ MS/MSD and LCS recovered at or above 45%, RPD <40

I. INTERNAL STANDARDS REVIEW CRITERIA:

- ☑ The following internal standards were used (or others as allowed)
  - 1,4-Dichlorobenzene-d_4, Naphthalene-d_8, Acenapththene-d_{10}, Phenanthrene-d_{10}, Chrysene-d_{12}, Perylene-d_{12}
- ☑ Internal standard areas within ± 50% of last calibration verification
- ☑ Internal standard retention times within ± 30 seconds of last calibration verification

J. TARGET ANALYTE IDENTIFICATION REVIEW CRITERIA:

- ☑ Results were consistent with historical data. New detections evaluated as follows:
- ☑ RRTs of the reported analytes within ± 0.06 RRT units of the standard RRT
- ☑ Sample spectra versus laboratory standard spectra criteria were evaluated:

Characteristic ions maximized in the same scan or within one scan of each other

- Characteristic ions present in the standard spectra were present in the sample spectra for analytes detected above the permit QL
- Relative intensities of the ions between the standard and sample spectra were within ±30%.

K. TARGET ANALYTE QUANTITATION REVIEW CRITERIA:

- ☑ Results were consistent with historical data. New detections evaluated as follows:
  -If analyte %RSD was 20% or less, use average relative response factor for quantitation.
  -If analyte %RSD was greater than 20%, use first or higher order regression fit of five calibration points (6 calibration points for 2nd order).
- ☑ Results that exceed the initial calibration range were reanalyzed at a higher dilution.
- ☑ Analyte concentrations recorded on the sample quantitation reports were accurately transferred to the sample summary sheets (laboratory report).

L. REPORTING:

- ☑ Detected analytes or results requiring validation are presented on the attached data validation report
- ☑ Results reported at or above permit QL (HWMU16) except 2,4-DNT and 2,6-DNT reviewed and validated to at or above DL.
- ☑ Results reported at or above permit DL and QL (HWMU5)

DATA EVALUATION FOR INORGANICS BY SW-846 METHOD 6020A (ICP/MS)

A. QC DELIVERABLES PACKAGE:

- ☑ Sample results included for sample locations
- ☑ Target analyte QLs reported at permit required QL
- ☑ Sample digestion method: 3005A
- ☑ Electronic data file reviewed
- ☑ VELAP accredited

B. TECHNICAL HOLDING TIMES / PRESERVATION REVIEW CRITERIA:

- ☑ 6 month holding time, pH<2 with Nitric Acid (HNO3)

C. INSTRUMENT CALIBRATION/TUNE CRITERIA:

Target analytes, 1 calibration blank and at least 1 standard or

- ☑ 1 calibration blank and at least 5 standards and
- ☑ Instrument calibrated for every analytical sequence, r>0.998
- ☑ Instrument tuned prior to analysis (%RSD <5%)

D. INSTRUMENT CALIBRATION CRITERIA:

- ☑ 10 sample frequency
- ☑ Use of calibration blank and check standard
- ☑ Recovery within 90-110%
- ☑ LLICV and LLCCV within 70-130% recovery

E. BLANK CRITERIA:

- N/A Trip Blank (check only if analyzed)
- N/A Equipment Blank
- ☑ Method/Other Lab Blanks (check only if analyzed)
- ☑ Interference free
- ☑ CCB 10 sample frequency

F. INTERFERENCE CHECK SAMPLES (ICS) CRITERIA:

- ☑ At beginning of batch or every 12 hours (80-120%)

G. MATRIX SPIKE DUPLICATE (MSD) CRITERIA:

- ☑ One MSD or sample duplicate per batch of 20 samples
- ☑ RPD ≤ 20 between MS and MSD results or sample and duplicate results
- ☑ Control limit is ± QL when sample values are less than 5 times QL (sample duplicate).

H. MATRIX SPIKE (MS) CRITERIA:

- ☑ 75-125% recovery, all analytes
- ☑ All analytes, spiked prior to digestion
- ☑ One matrix spike per analytical batch
- ☑ No more than 20 samples per analytical batch

I. BLIND FIELD SAMPLE DUPLICATE CRITERIA:

- ☑ 20% RPD for concentrations > QL

J. SAMPLE RESULTS CRITERIA:

- ☑ Results reported within instrument linear range

K. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

- ☑ All target analytes, 1 LCS per 20 samples, (80-120% Recovery)

L. INTERNAL STANDARDS (IS) CRITERIA:

- ☑ IS intensities; 70-125% RI

M. SERIAL DILUTION CRITERIA:

- ☑ Similar matrix
- ☑ If concentration >10 times QL, %Difference must be within 10%

N. REPORTING:

- ☑ Detected analytes or results requiring validation are presented on the attached data validation report
- ☑ Results reported at or above permit QL (HWMU16)
- ☑ Results reported at or above permit DL and QL (HWMU5)

A. QC DELIVERABLES PACKAGE:

- ☑ Mercury QL reported at permit required QL
- ☑ Electronic data file reviewed
- ☑ VELAP accredited

B. TECHNICAL HOLDING TIME / PRESERVATION REVIEW CRITERIA:

- ☑ 28 day holding time, Adjust pH <2 w/ HNO_3

C. INSTRUMENT CALIBRATION CRITERIA:

- ☑ 1 calibration blank and at least 5 standards
- ☑ ICAL standards within 5% of true value
- ☑ Instrument calibrated for every analytical sequence, r>0.995
- ☑ ICAL standard analyzed at the permit QL
- ☑ QL standard analyzed at or less than the permit required QL (70-130%R)
- ☑ QL standard analyzed at beginning of run, following ICV/ICB

D. INITIAL / CONTINUING CALIBRATION VERIFICATION CRITERIA:

- ☑ 10 sample frequency for CCV; recovery within 80-120%

E. BLANK CRITERIA:

- N/A Trip Blank (check only if analyzed)
- N/A Equipment Blank (check only if analyzed)
- ☑ Method/other laboratory blanks (check only if analyzed), Interference free

F. MATRIX SPIKE DUPLICATE (MSD) CRITERIA:

- ☑ One MSD or sample duplicate per batch of 20 samples
- ☑ RPD ≤ 20 between MS and MSD results or sample and duplicate results
- ☑ Control limit is ± QL when sample values are less than 5 times QL.

H. MATRIX SPIKE (MS) CRITERIA:

- ☑ 75-125% recovery
- ☑ MS spiked prior to digestion, One MS per analytical batch of 20 samples

H. FIELD SAMPLE DUPLICATE CRITERIA:

- ☑ Target analyte: mercury, Difference <10RPD

I. LABORATORY CONTROL SAMPLE (LCS) CRITERIA:

- ☑ Recovery within 80-120% range. Independent source from calibration standards.

J. SAMPLE RESULTS CRITERIA:

- ☑ Results reported within instrument calibration range

K. REPORTING:

- ☑ Detected analytes reported to at or above the permit QL. When applicable, results requiring validation are presented on the attached data validation report.

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Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

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Revisions to Original Data Set

Draper Aden Associates
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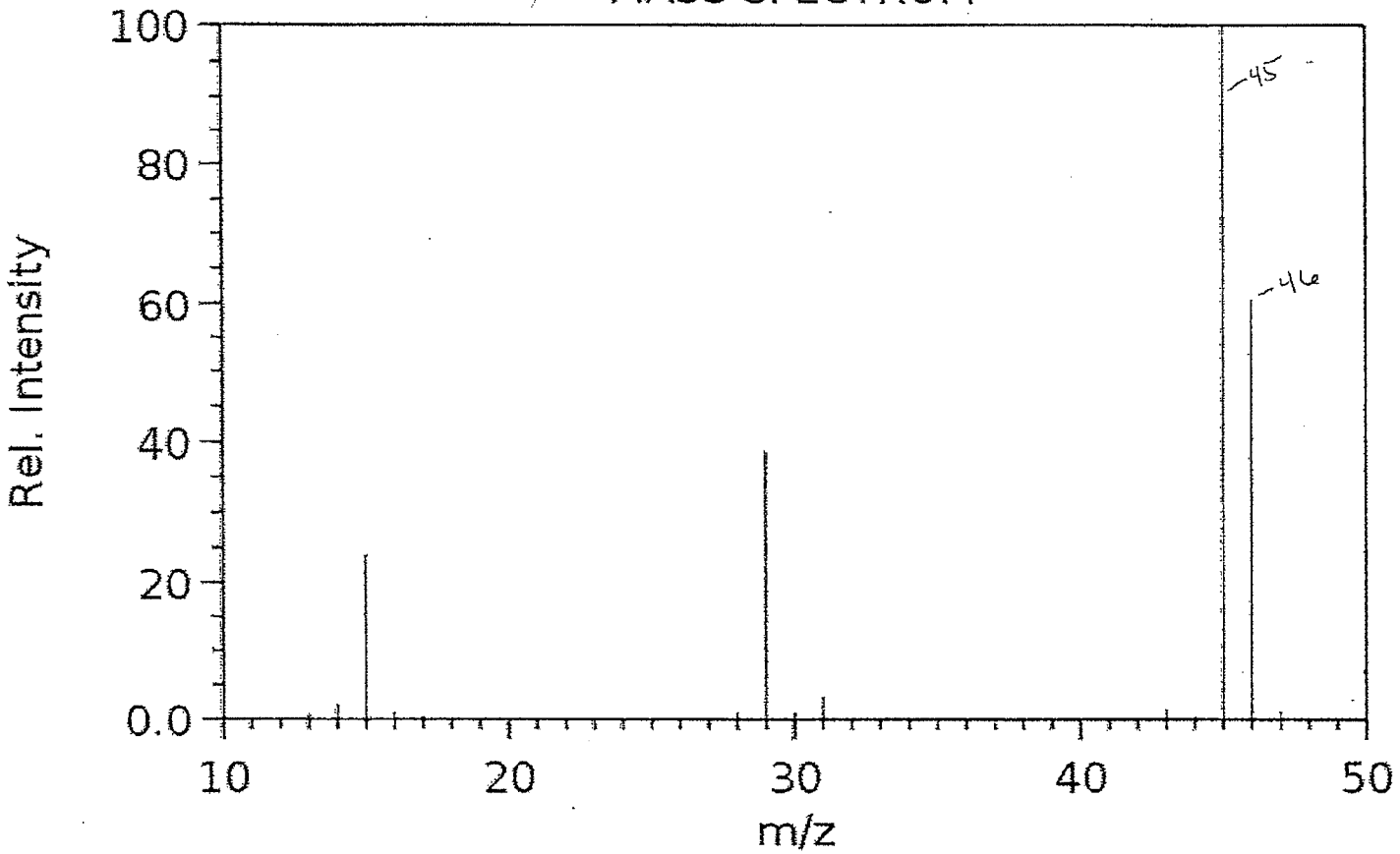
Dimethyl ether

MASS SPECTRUM



NIST Chemistry WebBook (http://webbook.nist.gov/chemistry)

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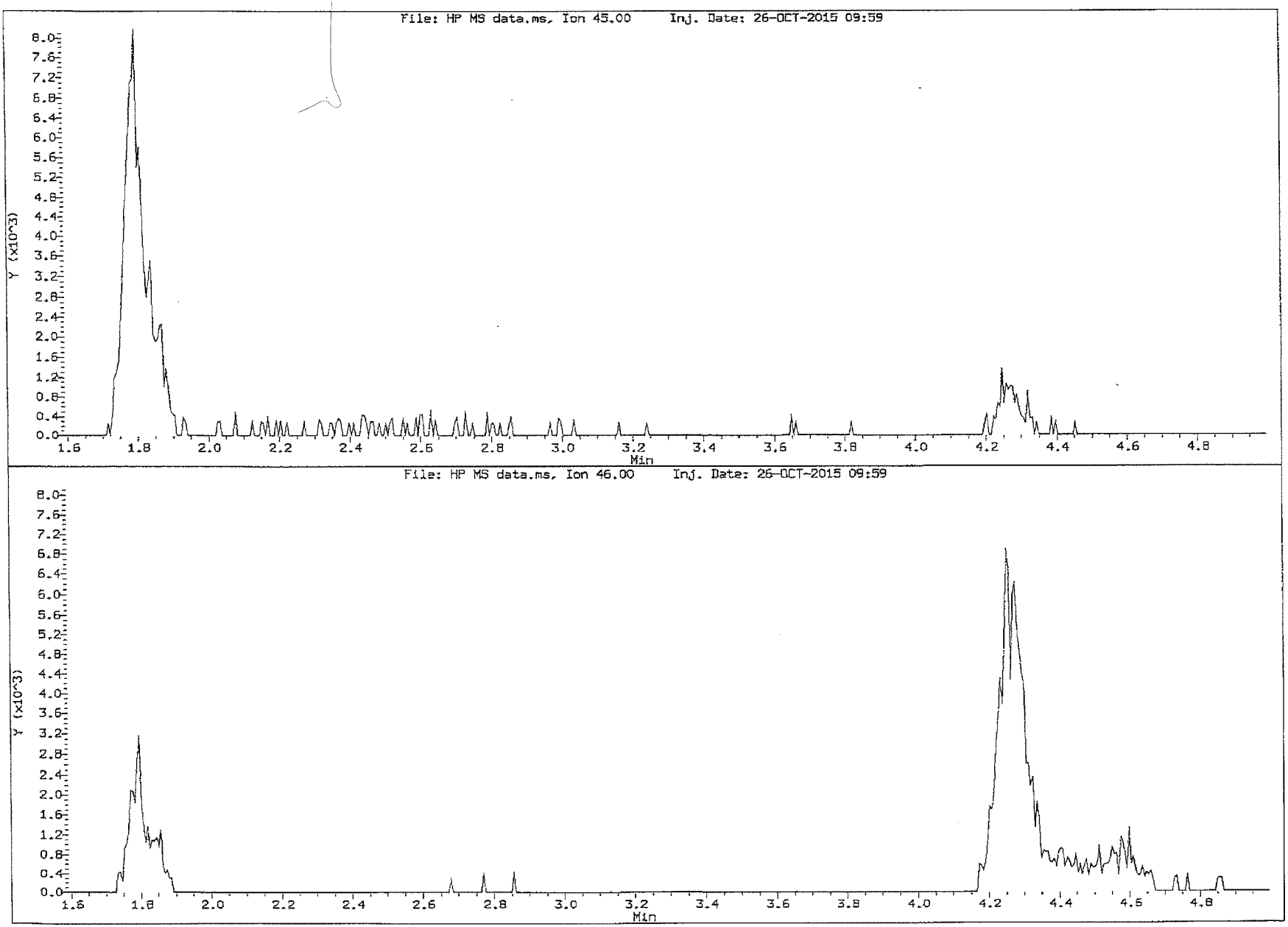

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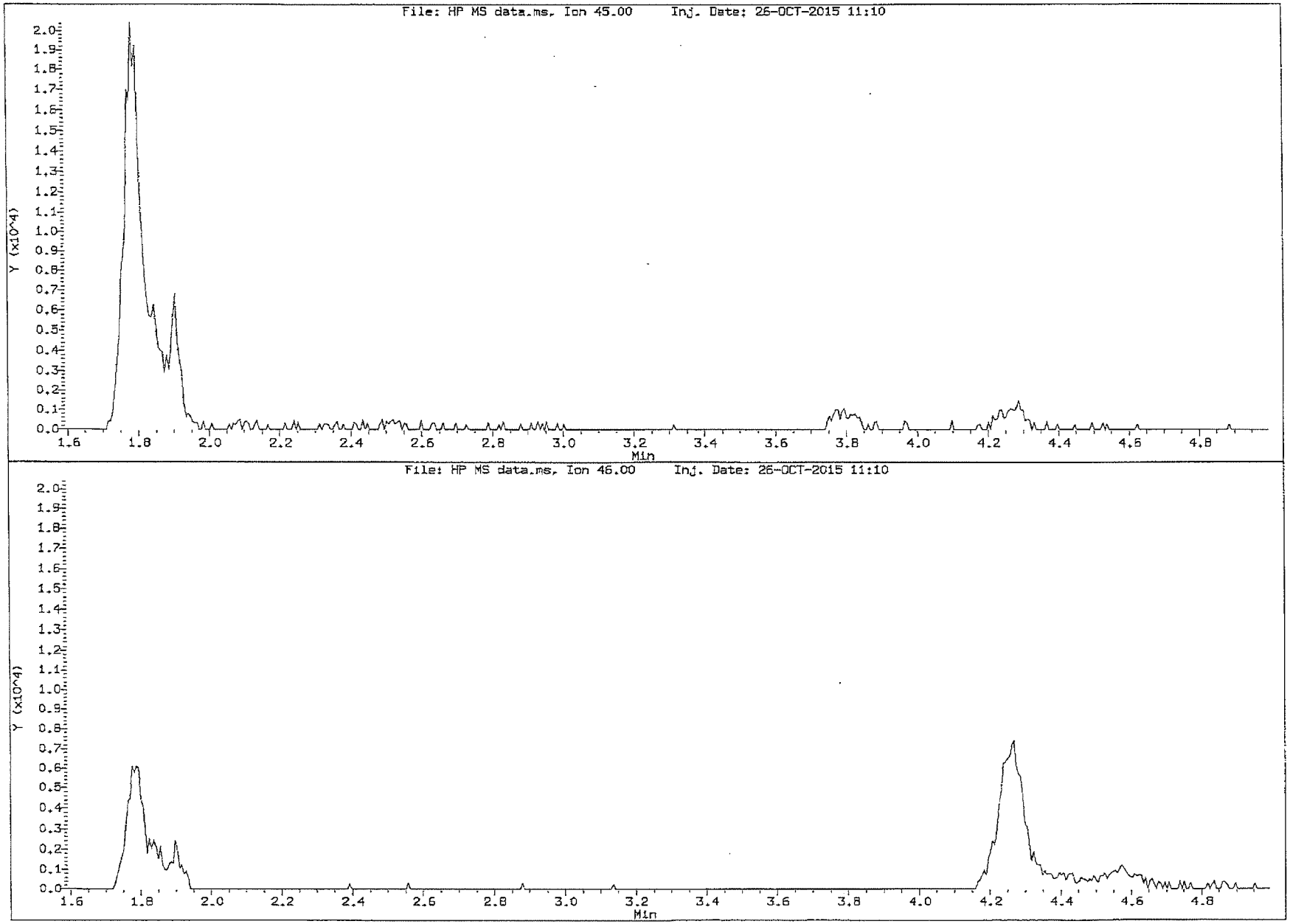

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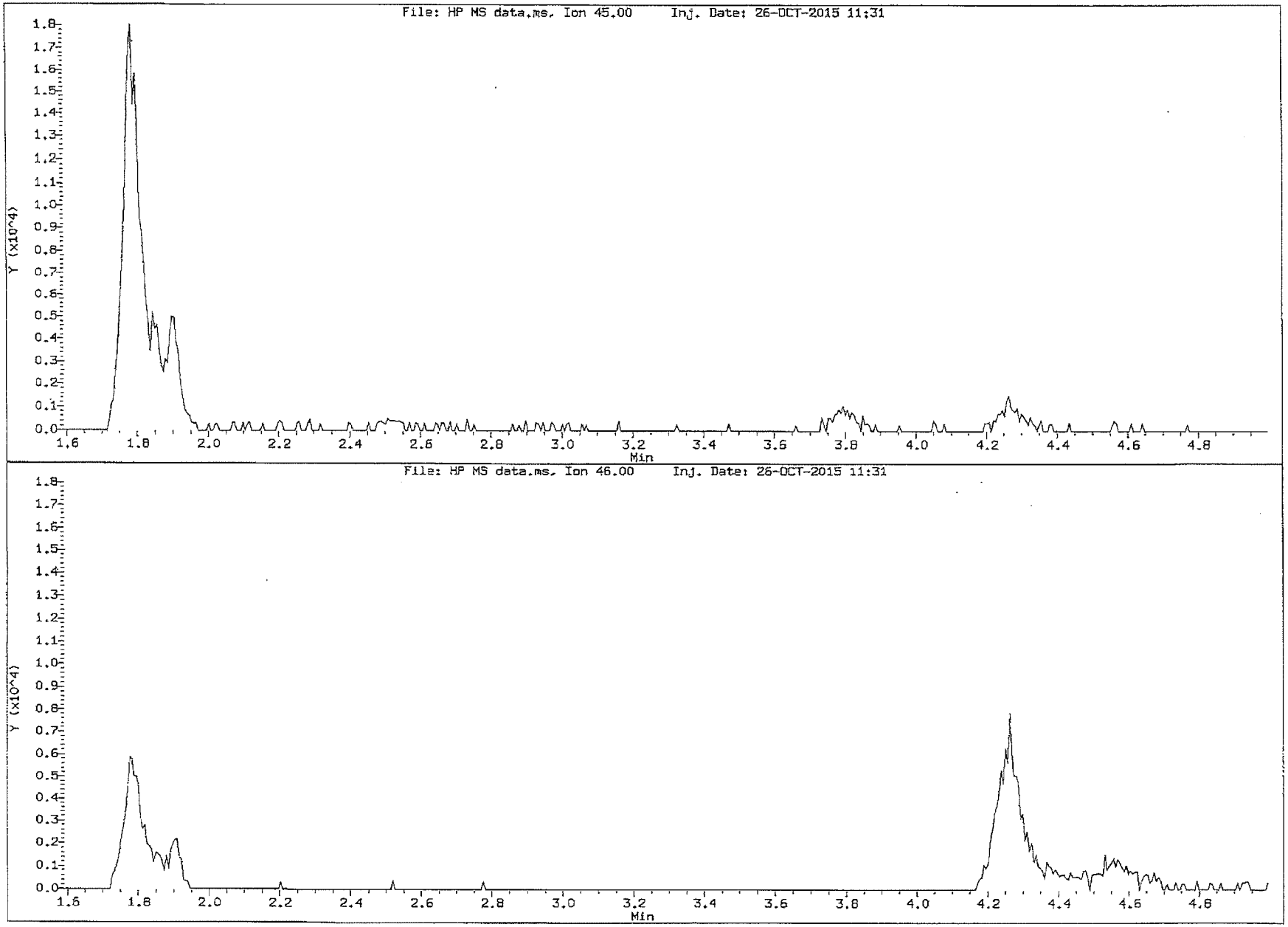

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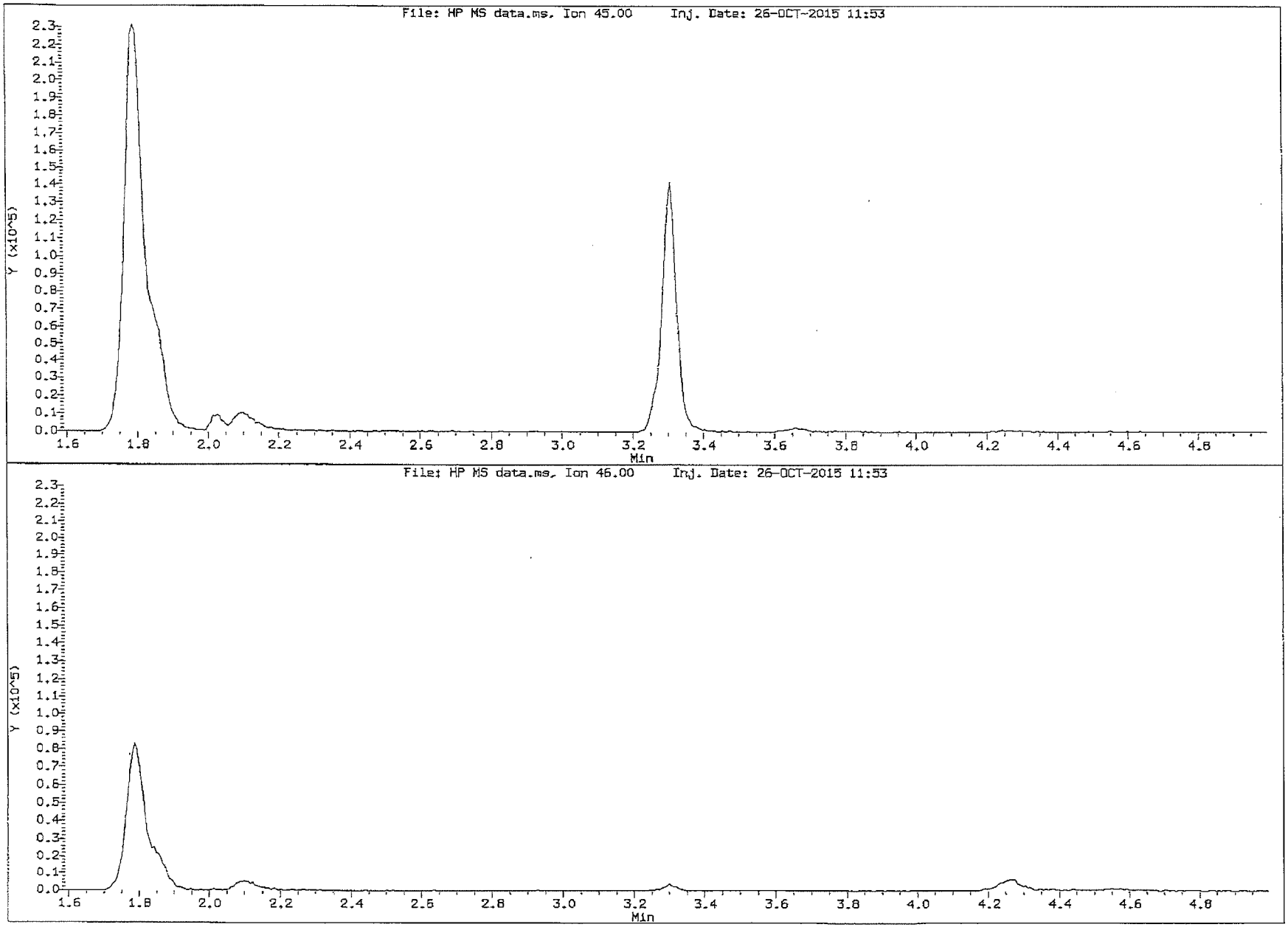
KEK/1973 10/26/15



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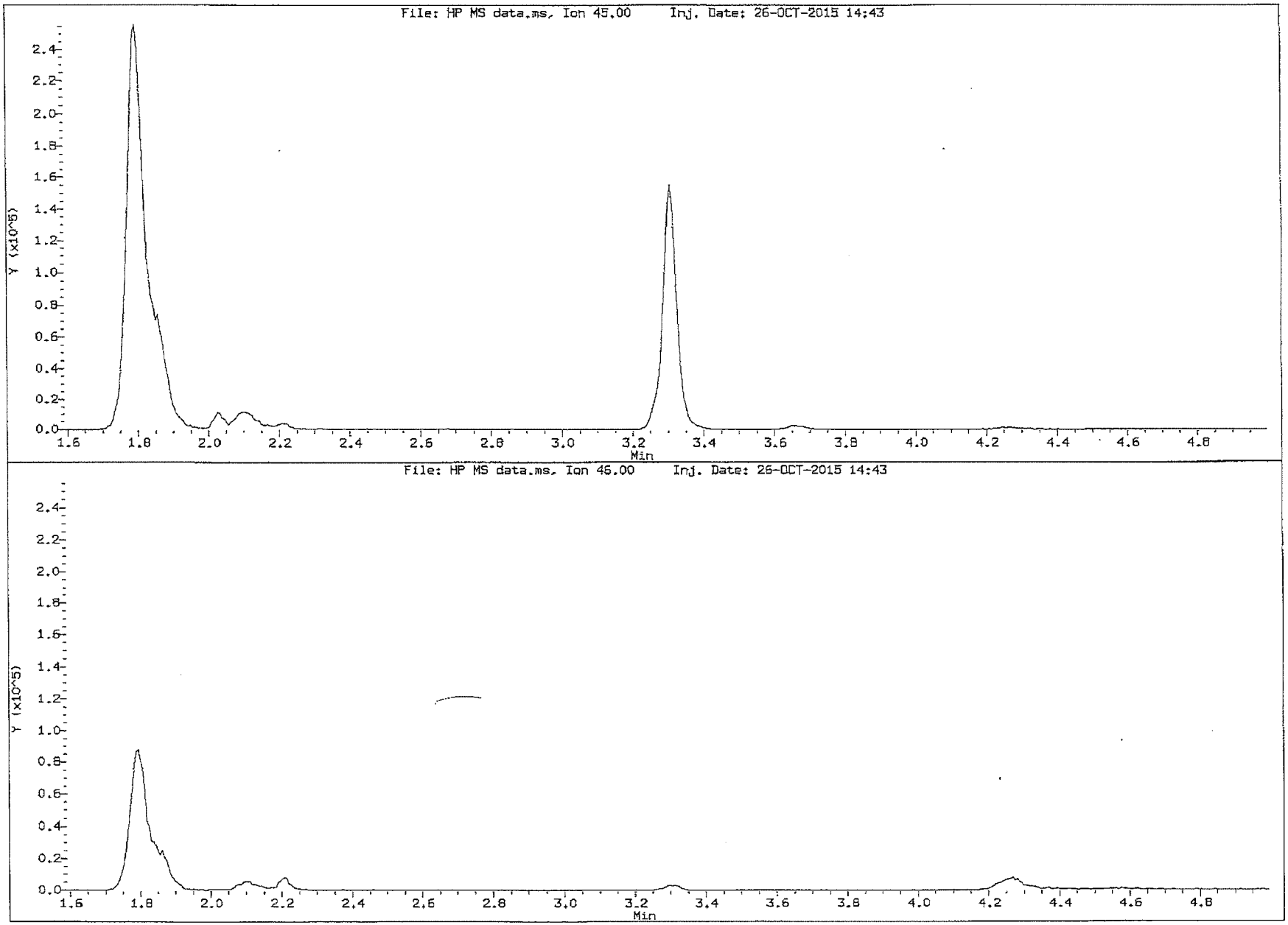

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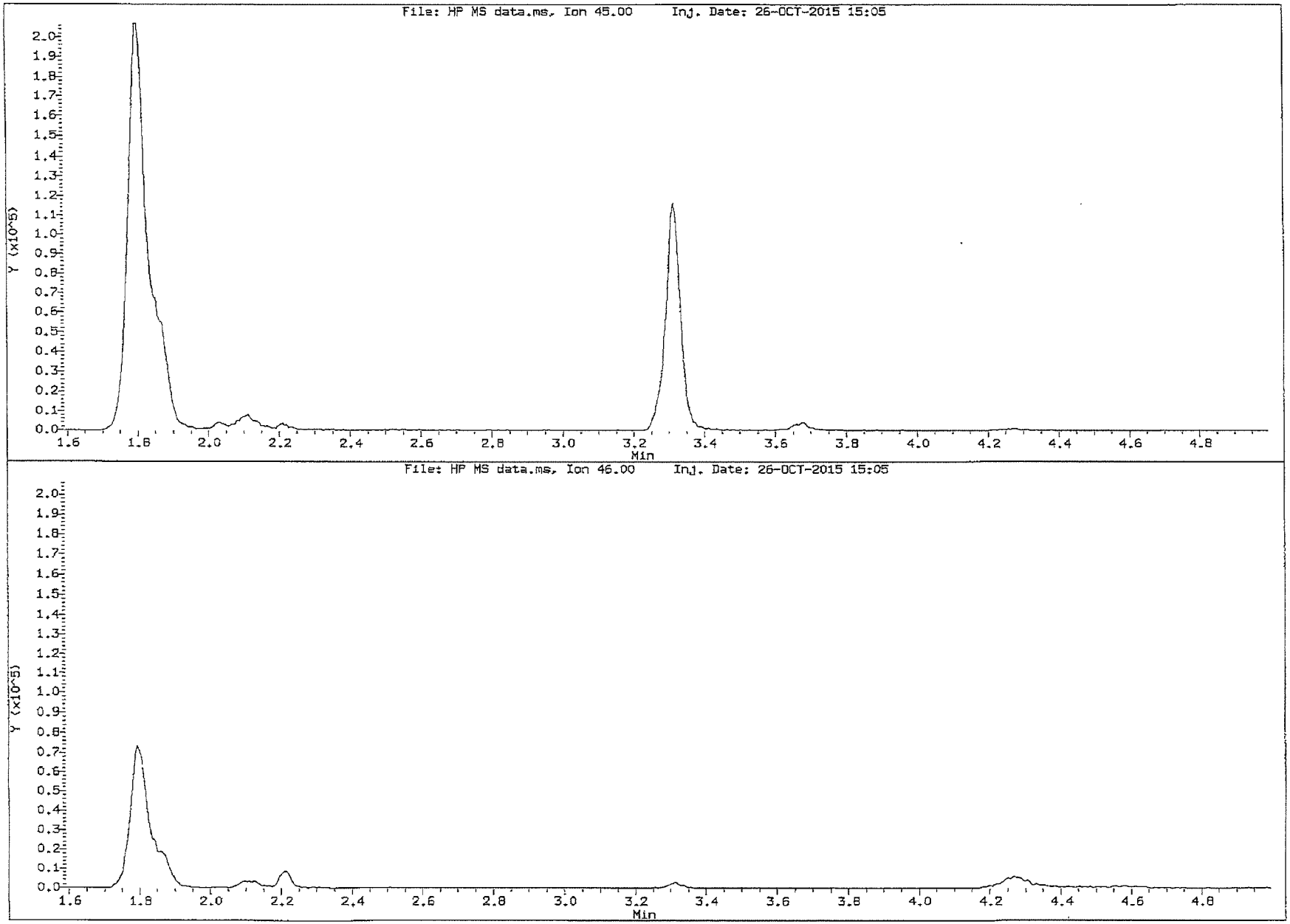
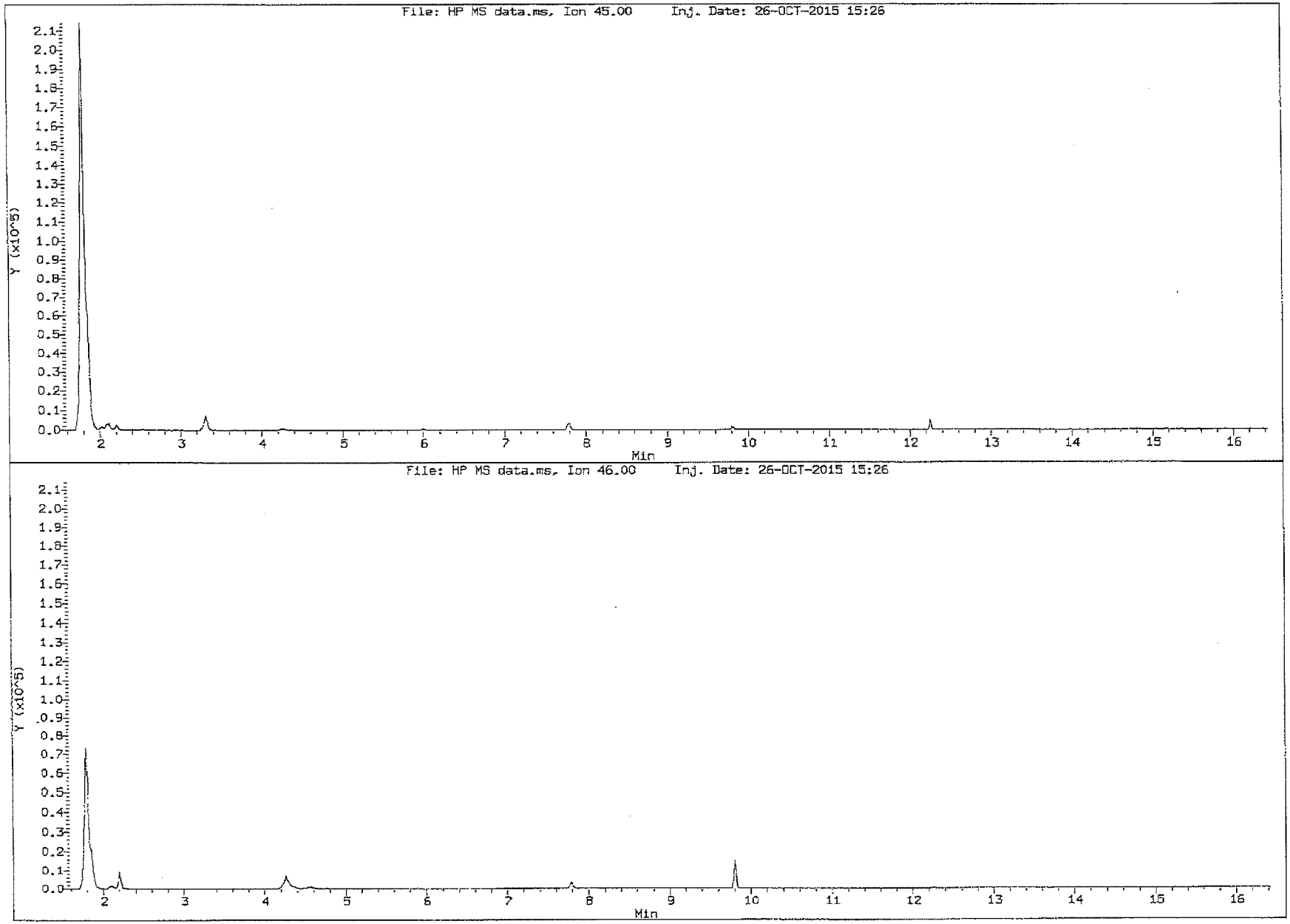


HC26308 Dimethyl Ether ND

KA52698 10-26-15



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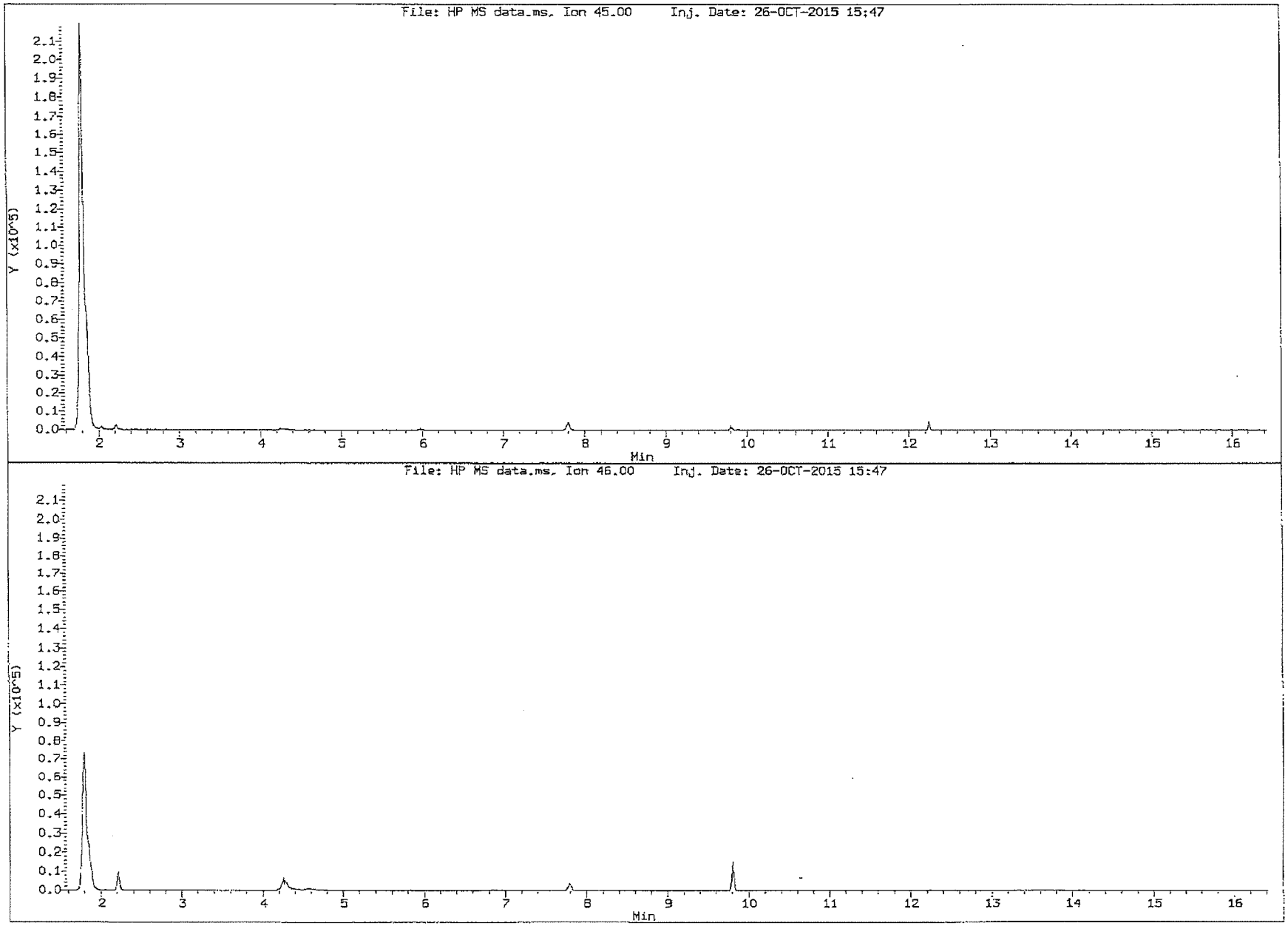
LAS2648 10-26-15



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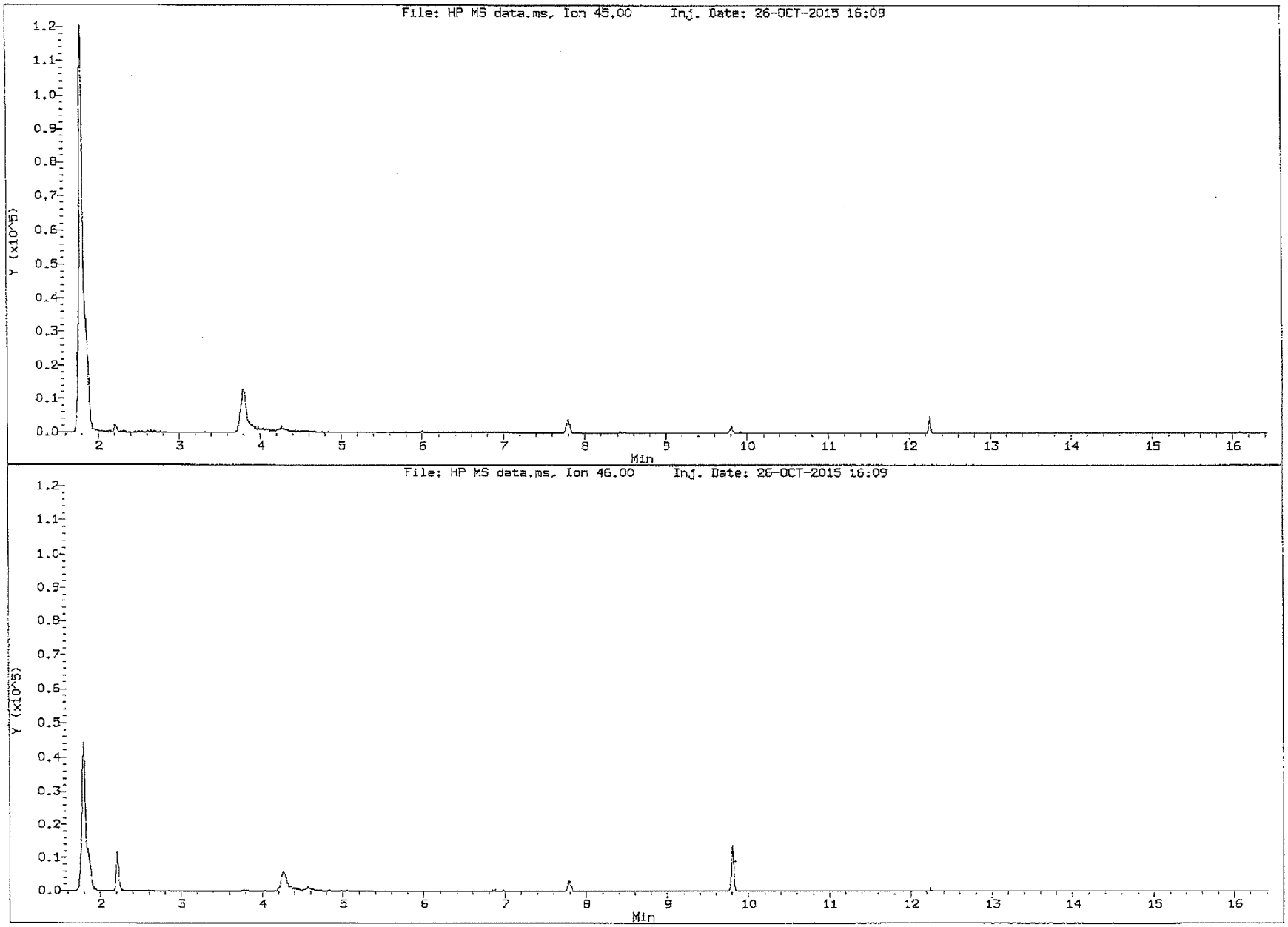
KA526648 10-26-15



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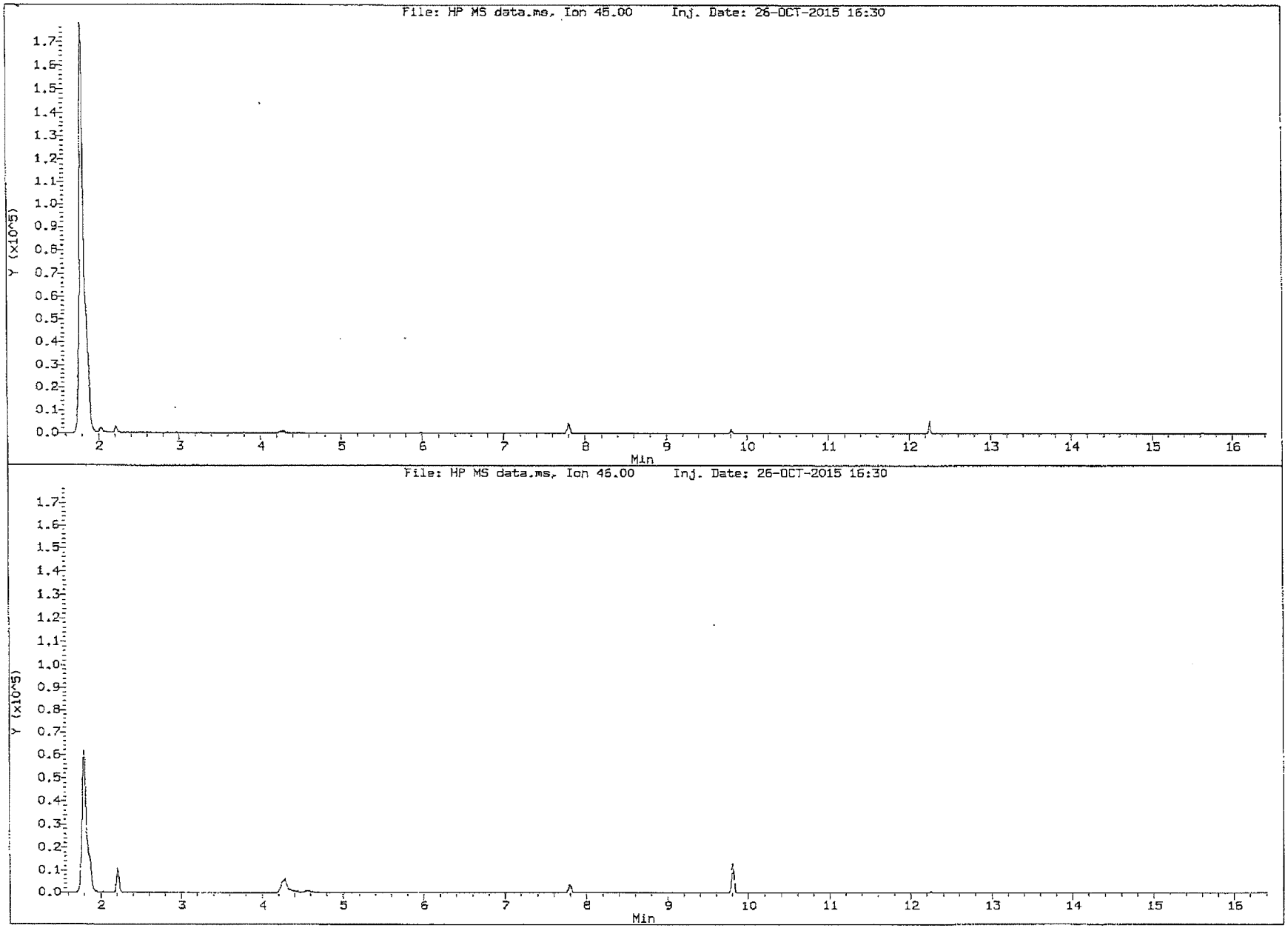
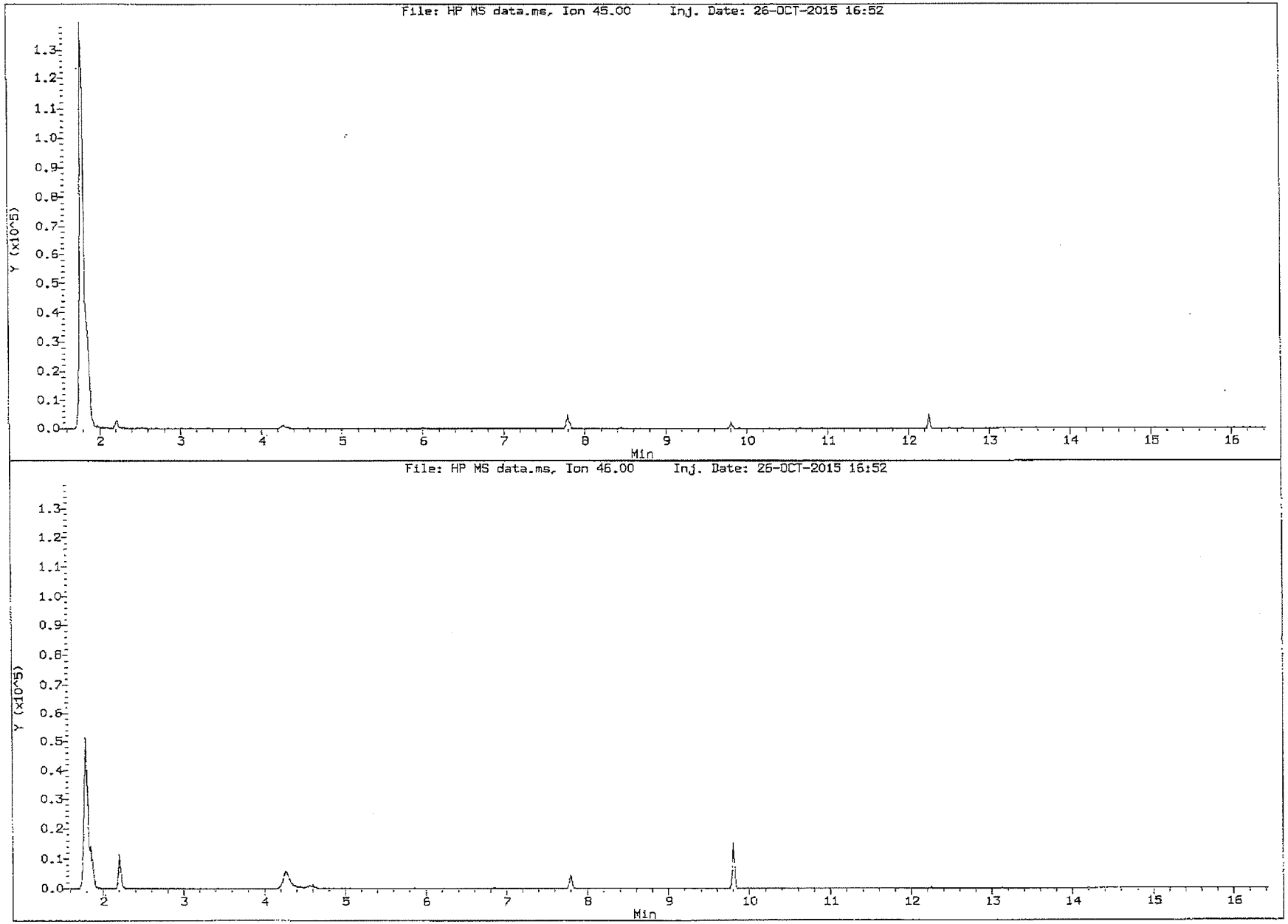
KA52648 10-26-15



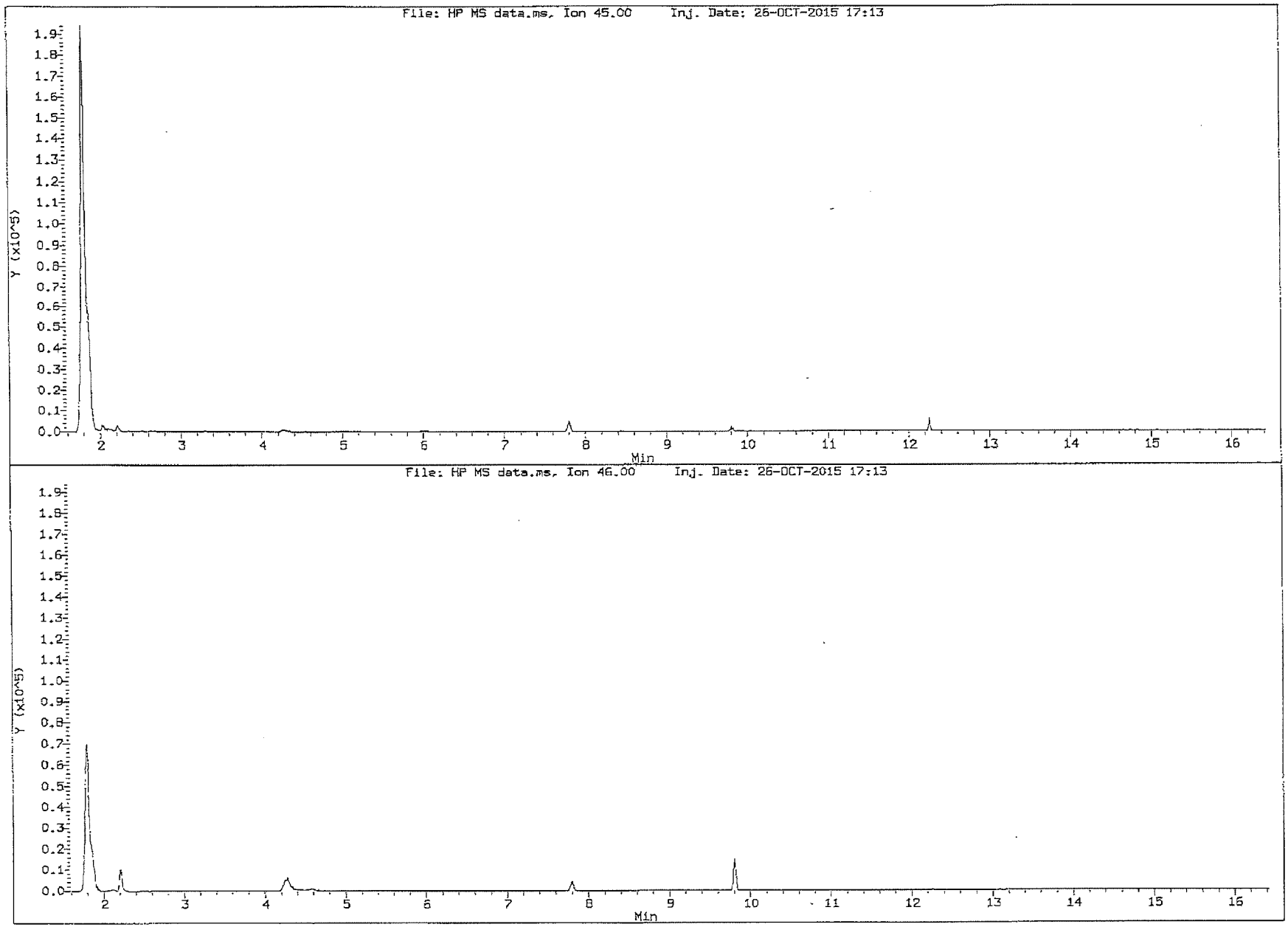
HC26512 Dimethyl Ether ND

KAS2648 10-26-15



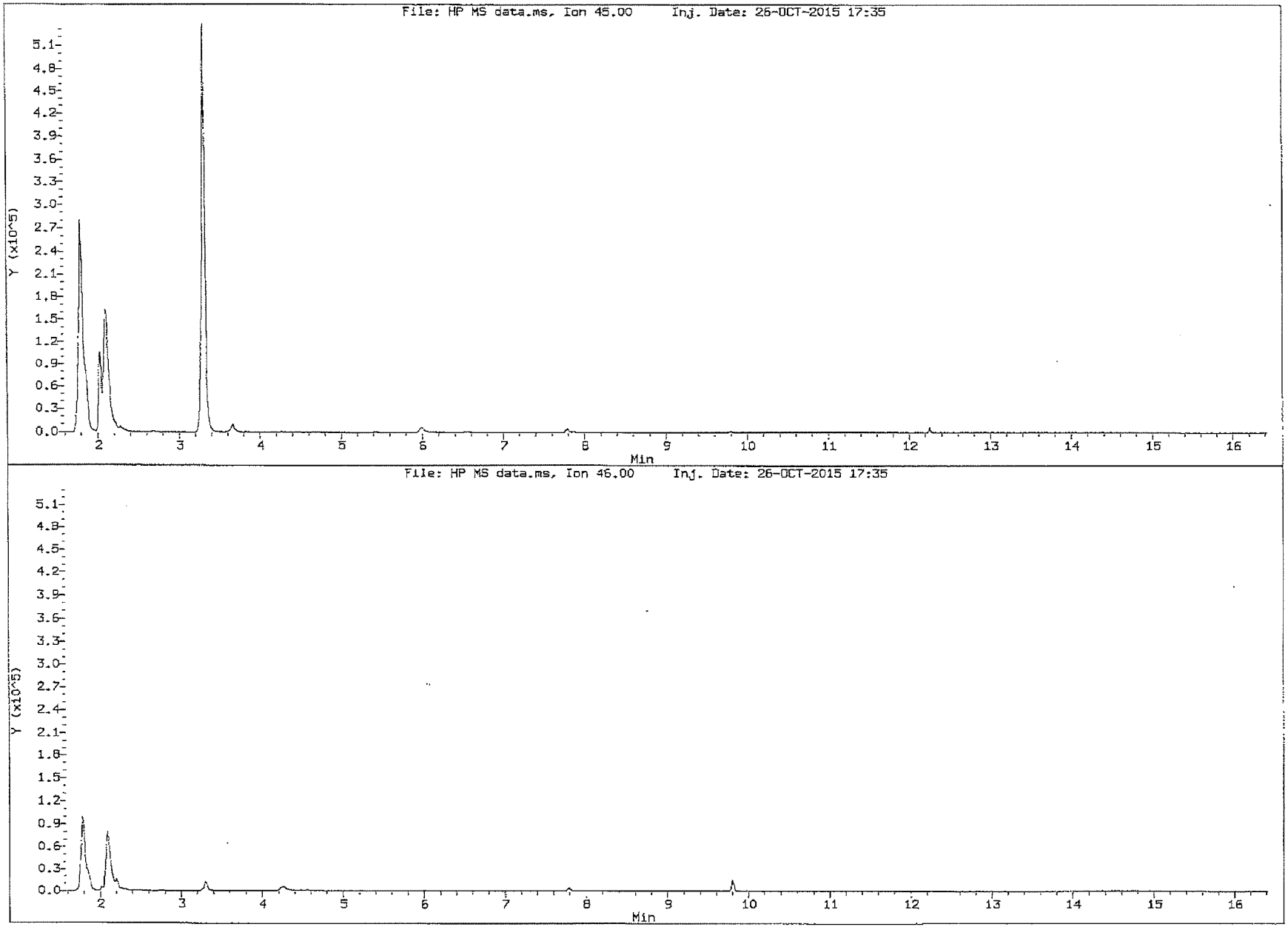
HC26513 Dimethyl Ether MD

KAS2648 10-26-13



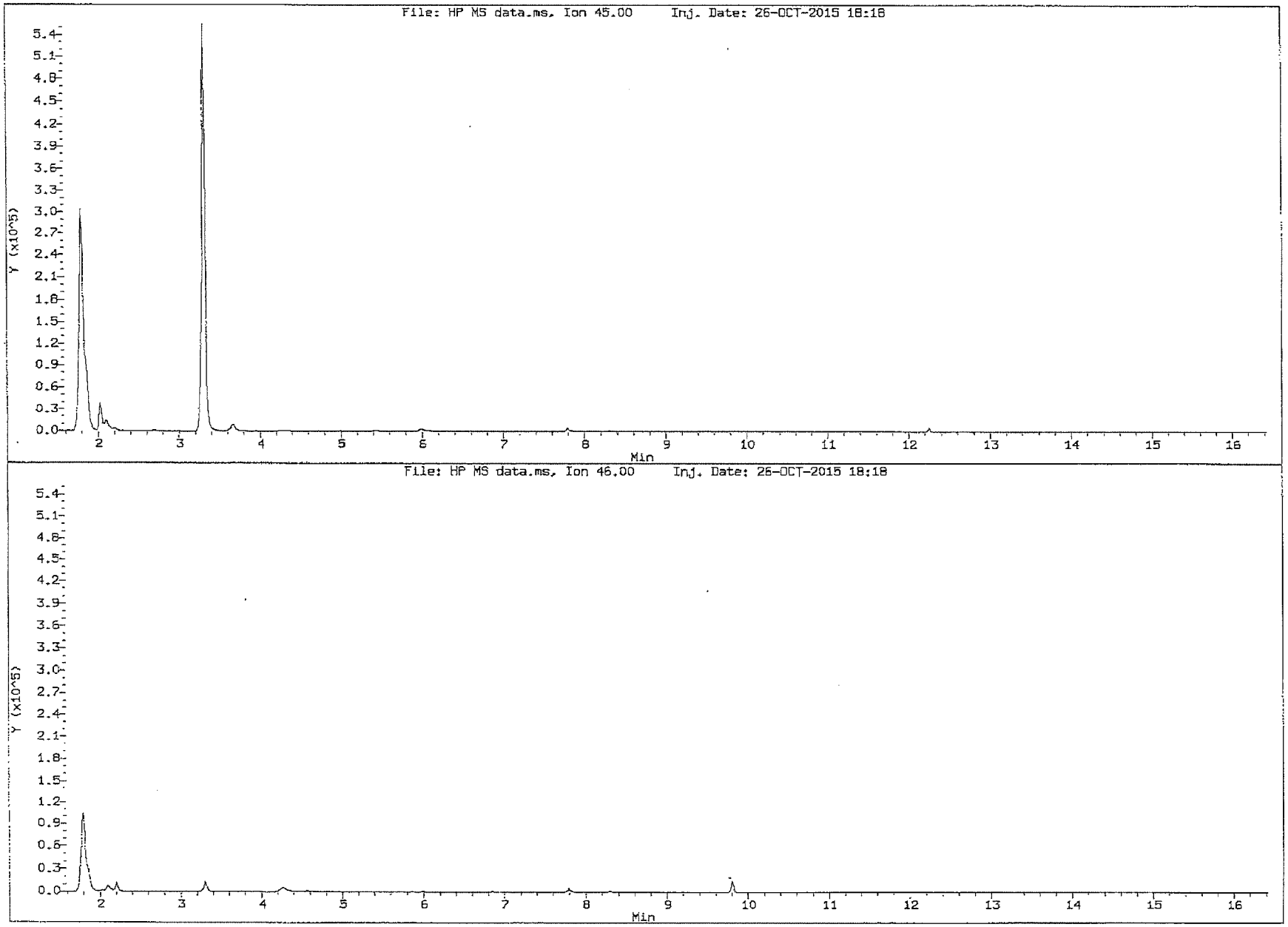
4C26514 Dimethyl Ether ND

KAS2648 10-26-15



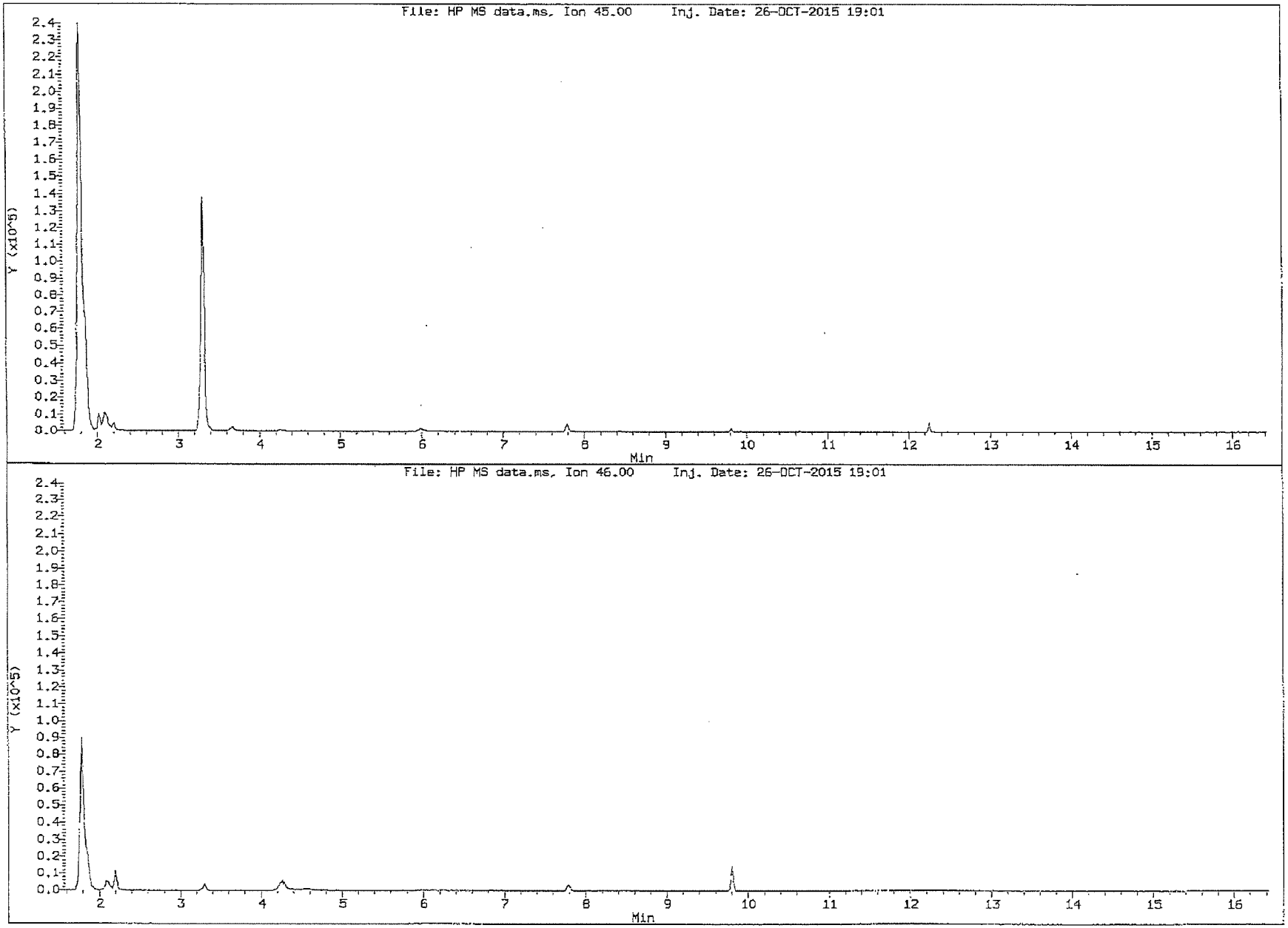
HC26516 Dimethyl Ether ND

KA52648 10-26-15



HC26518 Dimethyl Ether VD

KA526-18 10-26-15



Comprehensive Data Validation Report
Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit
Radford Army Ammunition Plant (RFAAP), Radford, Virginia
Facility: HWMU-5 Monitoring Event: Fourth Quarter 2015

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Cobalt	5WC21	75.2		75.2		5	No action taken. Blind field duplicate 5WDUP. RPD < 20
	5WDUP	72.6		72.6		5	No action taken. Blind field duplicate 5WC21. RPD < 20
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Trichloroethene	5WC21	2.9		2.9		1	No action taken. Blind field duplicate 5WDUP. RPD < 20.
	5WDUP	3.4		3.4		1	No action taken. Blind field duplicate 5WC21. RPD < 20.

Definitions:
Data Validation Qualifiers:
QL Denotes permit quantitation limit. **Q** Denotes data qualifier.
J Denotes analyte reported at or above quantitation limit and associated result is estimated.

OK JW 1/11/16

Comprehensive Data Validation Report

Radford Army Ammunition Plant (RFAAP), Radford, Virginia

Facility: HWMU-5 Groundwater Monitoring Event: Fourth Quarter 2015

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL Appendix J Analytes	Permit DL Appendix J Analytes	Units	Validation Notes
Method: 6020A											
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC											
Cobalt	5W8B	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.
	5W5B	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.
	5W7B	2.25	J	2.25	J	5	1	5	1	ug/l	Result < QL.
	5WC21	75.2		75.2		5	1	5	1	ug/l	No action taken. Blind field duplicate 5WDUP. RPD < 20
	5WC22	23.9		23.9		5	1	5	1	ug/l	No action taken.
	5WC23	7.08		7.08		5	1	5	1	ug/l	No action taken.
	5WDUP	72.6		72.6		5	1	5	1	ug/l	No action taken. Blind field duplicate 5WC21. RPD < 20
	5W12A	1	U	U		5	1	5	1	ug/l	Analyte not detected at or above DL or QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL Appendix J Analytes	Permit DL Appendix J Analytes	Units	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
1,1-Dichloroethene	5W8B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.4	U	U		1	0.4	1	0.44	ug/l	Analyte not detected at or above DL or QL.
cis-1,2-Dichloroethene	5W8B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	5WDUP	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.1	U	U		1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL.
trans-1,2-Dichloroethene	5W8B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5WC21	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WDUP.
	5WC22	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	5WC23	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL Appendix J Analytes	Permit DL Appendix J Analytes	Units	Validation Notes
Method: 8260C											
Laboratory: ELLE, Lancaster, PA											
trans-1,2-Dichloroethene	5WDUP	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL. Blind field duplicate 5WC21.
	5W12A	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.8	U	U		1	0.8	1	0.8	ug/l	Analyte not detected at or above DL or QL.
Trichloroethene	5W8B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5W5B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5W7B	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	5WC21	2.9		2.9		1	0.2	1	0.177	ug/l	No action taken. Blind field duplicate 5WDUP. RPD < 20.
	5WC22	3.3		3.3		1	0.2	1	0.177	ug/l	No action taken.
	5WC23	4.4		4.4		1	0.2	1	0.177	ug/l	No action taken.
	5WDUP	3.4		3.4		1	0.2	1	0.177	ug/l	No action taken. Blind field duplicate 5WC21. RPD < 20.
	5W12A	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 1	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
	Trip Blank 2	0.2	U	U		1	0.2	1	0.177	ug/l	Analyte not detected at or above DL or QL.
Vinyl chloride	5W8B	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	5W5B	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	5W7B	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	5WC21	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%). Blind field duplicate 5WDUP.
	5WC22	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	5WC23	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	5WDUP	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%). Blind field duplicate 5WC21.
	5W12A	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	Trip Blank 1	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).
	Trip Blank 2	0.1	U	U	J	1	0.1	1	0.1	ug/l	Analyte not detected at or above DL or QL. CV %D > +/-20% (23%).

Analyte	Sample ID	Lab Result	Q	Validated Result	Q	QL	DL	Permit QL Appendix J Analytes	Permit DL Appendix J Analytes	Units	Validation Notes

Definitions:

QL Denotes quantitation limit**.**
DL Denotes detection limit
Q Denotes data qualifier.
U Denotes analyte not detected at or above Detection Limit (DL) or Quantitation Limit (QL).
UA Denotes analyte not detected at or above adjusted sample DL or QL.
J Denotes analyte reported at or above the DL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above DL and QL and DL and QL are estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted DL and QL and adjusted DL and QL are estimated.
R Denotes result rejected.
Laboratory Data Qualifiers, "U" and "<", denote not detected at or above the QL.

Comprehensive Data Validation Report

Radford Army Ammunition Plant (RFAAP), Radford, Virginia

Sample/Blind Field Duplicate Results Greater Than the Quantitation Limit

Facility: HWMU-16 Monitoring Event: Fourth Quarter 2015

Draper Aden Associates
Engineering ♦ Surveying ♦ Environmental Services

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Barium	16WC1A	239		239		10	No action taken. Blind field duplicate 16WDUP. RPD <20.
	16WDUP	240		240		10	No action taken. Blind field duplicate 16WC1A. RPD <20.
Cobalt	16WC1A	5.38		5.38		5	No action taken. Blind field duplicate 16WDUP. RPD <20. Verification event Dec 4 (6.78 ug/l). Original result reported.
	16WDUP	5.91		5.91		5	No action taken. Blind field duplicate 16WC1A. RPD <20.
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1-Dichloroethane	16WC1A	1.8		1.8		1	No action taken. Blind field duplicate 16WDUP.
	16WDUP	1.9		1.9		1	No action taken. Blind field duplicate 16WC1A.
Diethyl ether	16WC1A	16		16	J	12.5	MS/MSD recovered low (73%/68%). Blind field duplicate 16WDUP.
	16WDUP	16		16	J	12.5	MS/MSD recovered low (73%/68%). Blind field duplicate 16WC1A.

Definitions:
Data Validation Qualifiers:
QL Denotes permit quantitation limit. Q Denotes data qualifier.
J Denotes analyte reported at or above quantitation limit and associated result is estimated.

JLK 1-11-16 JK

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Arsenic	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Barium	16C1	201		201		10	No action taken.
	16MW8	141		141		10	No action taken.
	16MW9	554		554		10	Analyzed in dilution (1:2). Actual QL 20 ug/l.
	16WC1A	239		239		10	No action taken. Blind field duplicate 16WDUP. RPD <20.
	16WC1B	145		145		10	No action taken.
	16WC2B	120		120		10	No action taken.
	16-2	231		231		10	No action taken.
	16-3	755		755		10	Analyzed in dilution (1:2). Actual QL 20 ug/l.
	16-5	182		182		10	No action taken.
	16SPRING	219		219		10	No action taken.
	16WDUP	240		240		10	No action taken. Blind field duplicate 16WC1A. RPD <20.
Beryllium	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Beryllium	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Cadmium	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Chromium	16C1	5	U	U		5	Analyte not detected at or above QL.
	16MW8	5	U	U		5	Analyte not detected at or above QL.
	16MW9	5	U	U		5	Analyte not detected at or above QL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	5	U	U		5	Analyte not detected at or above QL.
	16WC2B	5	U	U		5	Analyte not detected at or above QL.
	16-2	5	U	U		5	Analyte not detected at or above QL.
	16-3	5	U	U		5	Analyte not detected at or above QL.
	16-5	5	U	U		5	Analyte not detected at or above QL.
	16SPRING	5	U	U		5	Analyte not detected at or above QL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Cobalt	16C1	5	U	U		5	Analyte not detected at or above QL.
	16MW8	5	U	U		5	Analyte not detected at or above QL.
	16MW9	5	U	U		5	Analyte not detected at or above QL.
	16WC1A	5.38		5.38		5	No action taken. Blind field duplicate 16WDUP. RPD <20. Verification event Dec 4 (6.78 ug/l). Original result reported.
	16WC1B	17		17		5	No action taken.
	16WC2B	5	U	U		5	Analyte not detected at or above QL.
	16-2	5	U	U		5	Analyte not detected at or above QL.
	16-3	5	U	U		5	Analyte not detected at or above QL.
	16-5	5	U	U		5	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Cobalt	16SPRING	5	U	U		5	Analyte not detected at or above QL.
	16WDUP	5.91		5.91		5	No action taken. Blind field duplicate 16WC1A. RPD <20.
Copper	16C1	5	U	U		5	Analyte not detected at or above QL.
	16MW8	10.9		10.9		5	No action taken.
	16MW9	5	U	U		5	Analyte not detected at or above QL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	5	U	U		5	Analyte not detected at or above QL.
	16WC2B	5	U	U		5	Analyte not detected at or above QL.
	16-2	5	U	U		5	Analyte not detected at or above QL.
	16-3	5	U	U		5	Analyte not detected at or above QL.
	16-5	5	U	U		5	Analyte not detected at or above QL.
	16SPRING	5	U	U		5	Analyte not detected at or above QL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Lead	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Nickel	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	15.3		15.3		10	No action taken.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 6020A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Nickel	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Vanadium	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
Zinc	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	31.1		31.1		10	No action taken.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	14.1		14.1		10	No action taken.
	16-3	12.9		12.9		10	No action taken.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.

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Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 7470A							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Mercury	16C1	2	U	U		2	Analyte not detected at or above QL.
	16MW8	2	U	U		2	Analyte not detected at or above QL.
	16MW9	2	U	U		2	Analyte not detected at or above QL.
	16WC1A	2	U	U		2	Analyte not detected at or above QL.
	16WC1B	2	U	U		2	Analyte not detected at or above QL.
	16WC2B	2	U	U		2	Analyte not detected at or above QL.
	16-2	2	U	U		2	Analyte not detected at or above QL.
	16-3	2	U	U		2	Analyte not detected at or above QL.
	16-5	2	U	U		2	Analyte not detected at or above QL.
	16SPRING	2	U	U		2	Analyte not detected at or above QL.
	16WDUP	2	U	U		2	Analyte not detected at or above QL. Blind field duplicate 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Benzene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
2-Butanone	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	10	U	U		10	Analyte not detected at or above QL.
	Trip_Blank_2	10	U	U		10	Analyte not detected at or above QL.
Carbon tetrachloride	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Carbon tetrachloride	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Chloroethane	16C1	4.8		4.8		1	No action taken.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	2.5		2.5		1	No action taken.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Dichlorodifluoromethane	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Dichlorodifluoromethane	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
1,1-Dichloroethane	16C1	7.7		7.7		1	No action taken.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	7.4		7.4		1	No action taken.
	16WC1A	1.8		1.8		1	No action taken. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1.9		1.9		1	No action taken. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
1,1-Dichloroethene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Diethyl ether	16C1	55		55	J	12.5	Analyzed in dilution (1:2.5). Actual QL 1.25 ug/L. MS/MSD recovered low (73%/68%).
	16MW8	13		13	J	12.5	MS/MSD recovered low (73%/68%).
	16MW9	50		50	J	12.5	Analyzed in dilution (1:4). Actual QL 2 ug/L. MS/MSD recovered low (73%/68%).
	16WC1A	16		16	J	12.5	MS/MSD recovered low (73%/68%). Blind field duplicate 16WDUP.
	16WC1B	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Diethyl ether	16WC2B	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	16-2	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	16-3	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	16-5	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	16SPRING	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	16WDUP	16		16	J	12.5	MS/MSD recovered low (73%/68%). Blind field duplicate 16WC1A.
	Trip_Blank_1	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
	Trip_Blank_2	13	U	U	J	12.5	Analyte not detected at or above QL. MS/MSD recovered low (73%/68%).
Dimethyl ether	16C1	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16MW8	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16MW9	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16WC1A	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC. Blind field duplicate 16WDUP.
	16WC1B	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16WC2B	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16-2	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16-3	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16-5	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16SPRING	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	16WDUP	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC. Blind field duplicate 16WC1A.
	Trip_Blank_1	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
	Trip_Blank_2	13	U	U	J	12.5	Analyte not detected at or above QL. Analyte reported by TIC.
Ethylbenzene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Ethylbenzene	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Chloromethane	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Methylene chloride	16C1	1.7		1.7		1	No action taken.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Tetrachloroethene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
Tetrachloroethene	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Toluene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
1,1,1-Trichloroethane	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	0.24	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1,1-Trichloroethane	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Trichloroethene	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Trichlorofluoromethane	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.
	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
1,1,2-Trichloro-1,2,2-Trifluoroethane	16C1	1	U	U		1	Analyte not detected at or above QL.
	16MW8	1	U	U		1	Analyte not detected at or above QL.
	16MW9	1	U	U		1	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8260C							
Laboratory: ELLE, Lancaster, PA							
1,1,2-Trichloro-1,2,2-Trifluoroethane	16WC1A	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	1	U	U		1	Analyte not detected at or above QL.
	16WC2B	1	U	U		1	Analyte not detected at or above QL.
	16-2	1	U	U		1	Analyte not detected at or above QL.
	16-3	1	U	U		1	Analyte not detected at or above QL.
	16-5	1	U	U		1	Analyte not detected at or above QL.
	16SPRING	1	U	U		1	Analyte not detected at or above QL.
	16WDUP	1	U	U		1	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	1	U	U		1	Analyte not detected at or above QL.
	Trip_Blank_2	1	U	U		1	Analyte not detected at or above QL.
Xylenes (Total)	16C1	3	U	U		3	Analyte not detected at or above QL.
	16MW8	3	U	U		3	Analyte not detected at or above QL.
	16MW9	3	U	U		3	Analyte not detected at or above QL.
	16WC1A	3	U	U		3	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	3	U	U		3	Analyte not detected at or above QL.
	16WC2B	3	U	U		3	Analyte not detected at or above QL.
	16-2	3	U	U		3	Analyte not detected at or above QL.
	16-3	3	U	U		3	Analyte not detected at or above QL.
	16-5	3	U	U		3	Analyte not detected at or above QL.
	16SPRING	3	U	U		3	Analyte not detected at or above QL.
	16WDUP	3	U	U		3	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
	Trip_Blank_1	3	U	U		3	Analyte not detected at or above QL.
	Trip_Blank_2	3	U	U		3	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
Diethyl phthalate	16C1	5	U	U		5	Analyte not detected at or above QL.
	16MW8	5	U	U		5	Analyte not detected at or above QL.
	16MW9	5	U	U		5	Analyte not detected at or above QL.
	16WC1A	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	5	U	U		5	Analyte not detected at or above QL.
	16WC2B	5	U	U		5	Analyte not detected at or above QL.
	16-2	5	U	U		5	Analyte not detected at or above QL.
	16-3	5	U	U		5	Analyte not detected at or above QL.
	16-5	5	U	U		5	Analyte not detected at or above QL.
	16SPRING	5	U	U		5	Analyte not detected at or above QL.
	16WDUP	5	U	U		5	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
2,4-Dinitrotoluene	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.
	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.
2,6-Dinitrotoluene	16C1	10	U	U		10	Analyte not detected at or above QL.
	16MW8	10	U	U		10	Analyte not detected at or above QL.
	16MW9	10	U	U		10	Analyte not detected at or above QL.
	16WC1A	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WDUP.
	16WC1B	10	U	U		10	Analyte not detected at or above QL.
	16WC2B	10	U	U		10	Analyte not detected at or above QL.
	16-2	10	U	U		10	Analyte not detected at or above QL.
	16-3	10	U	U		10	Analyte not detected at or above QL.
	16-5	10	U	U		10	Analyte not detected at or above QL.
	16SPRING	10	U	U		10	Analyte not detected at or above QL.

Analyte	Sample ID	Laboratory Result (ug/L)	Q	Validated Result (ug/L)	Q	QL (ug/L)	Validation Notes
Method: 8270D							
Laboratory: CompuChem, a Division of Liberty Analytical, Cary, NC							
2,6-Dinitrotoluene	16WDUP	10	U	U		10	Analyte not detected at or above QL. Blind field duplicate 16WC1A.

Definitions:

Appendix IX monitoring events and compliance monitoring wells:
For Appendix IX monitoring events, all compliance well results evaluated to the project detection limit.
See separate table for Appendix IX monitoring event detection limits.
QLDenotes permit quantitation limit**.**
Q Denotes data qualifier.
U Denotes analyte not detected at or above laboratory detection limit (DL) or QL.
J Denotes analyte reported at or above laboratory detection limit and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above laboratory detection limit and project required quantitation limit/detection limit is estimated.
UA Denotes analyte not detected at or above adjusted sample detection limit /QL.
UN Denotes analyte concentration is less than the quantitation limit and five times the blank concentration. Analyte was not reliably detected due to blank contamination.
R Denotes result rejected.
Laboratory Data Qualifiers,
"U" and "<", denote not detected at or above the detection limit or QL.
B or J denote result detected between DL and QL, associated value should be considered an estimated concentration.

Appendix IX monitoring events:
Third Quarter 2003, Second Quarter 2004, Second Quarter 2005, Third Quarter 2006, Second Quarter 2007, Second Quarter 2008,
Second Quarter 2009, Second Quarter 2010, Second Quarter 2011, Second Quarter 2012, Second Quarter 2013. Second Quarter 2014, Second Quarter 2015

Definitions for Non-Appendix IX Monitoring Events and plume monitoring wells:
QL Denotes permit quantitation limit**.**
Q Denotes data qualifier.
U Denotes analyte not detected at or above QL.
UA Denotes analyte not detected at or above adjusted sample QL. See data validation report for further explanation.
J Denotes analyte reported at or above QL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not detected at or above QL and QL is estimated. When used with "UA"(i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated.
R Denotes result rejected. See data validation report for further explanation.
Laboratory Data Qualifiers, "U" and "<", denote not detected at or above the QL.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
DIVISION OF CONSOLIDATED LABORATORY SERVICES

Certifies that

VA Laboratory ID#: 460188
Compuchem, A Division of Liberty Analytical

501 Madison Avenue
Cary, NC 27513

Owner: JOSEPH WORTLEY
Responsible Official: WILLIAM WARING

Having met the requirements of 1 VAC 30-46
and the National Environmental Laboratory Accreditation Conference 2003 Standard
is hereby approved as an

Accredited Laboratory

As more fully described in the attached Scope of Accreditation

Effective Date: **September 15, 2015**
Expiration Date: **September 14, 2016**
Certificate # 8053

Denise M. Toney

Denise M. Toney, Ph.D., HCLD
DGS Deputy Director for Laboratories

Continued accreditation status depends on successful ongoing participation in the program.
Certificate to be conspicuously displayed at the laboratory.
Not valid unless accompanied by a valid Virginia Environmental Laboratory Accreditation Program (VELAP) Scope of Accreditation.
Customers are urged to verify the laboratory's current accreditation status.

Certificate Not Transferable

Surrender Upon Revocation

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	FL
EPA 1664 A	OIL AND GREASE (AS HEM)	FL
EPA 300.0 REV 2.1	CHLORIDE	FL
EPA 300.0 REV 2.1	NITRATE AS N	FL
EPA 300.0 REV 2.1	NITRITE AS N	FL
EPA 300.0 REV 2.1	SULFATE	FL
EPA 335.4 REV 1.0	CYANIDE	FL
EPA 351.2 REV 2	KJELDAHL NITROGEN - TOTAL	FL
EPA 353.2 REV 2	NITRATE/NITRITE	FL
EPA 365.4	PHOSPHORUS, TOTAL	FL
EPA 6010 C	ALUMINUM	FL
EPA 6010 C	ARSENIC	FL
EPA 6010 C	BERYLLIUM	FL
EPA 6010 C	CADMIUM	FL
EPA 6010 C	CHROMIUM	FL
EPA 6010 C	COPPER	FL
EPA 6010 C	LEAD	FL
EPA 6010 C	MANGANESE	FL
EPA 6010 C	NICKEL	FL
EPA 6010 C	SELENIUM	FL
EPA 6010 C	SODIUM	FL
EPA 6010 C	TIN	FL
EPA 6010 C	VANADIUM	FL
EPA 6020 A	ANTIMONY	FL
EPA 6020 A	BARIUM	FL
EPA 6020 A	CADMIUM	FL
EPA 6020 A	COBALT	FL
EPA 6020 A	LEAD	FL
EPA 6020 A	NICKEL	FL
EPA 6020 A	SILVER	FL
EPA 6020 A	VANADIUM	FL
EPA 7470 A	MERCURY	FL
EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	FL
EPA 8081 B	4,4'-DDE	FL
EPA 8081 B	ALDRIN	FL
EPA 130.1	TOTAL HARDNESS AS CACO3	FL
EPA 1664 A	TOTAL PETROLEUM HYDROCARBONS (TPH) (AS NONPOLAR MATERIAL, SGT-HEM)	FL
EPA 300.0 REV 2.1	FLUORIDE	FL
EPA 300.0 REV 2.1	NITRATE/NITRITE	FL
EPA 300.0 REV 2.1	ORTHOPHOSPHATE AS P	FL
EPA 310.2	ALKALINITY AS CACO3	FL
EPA 350.1 REV 2	AMMONIA AS N	FL
EPA 353.2 REV 2	NITRATE AS N	FL
EPA 353.2 REV 2	NITRITE AS N	FL
EPA 420.4 REV 1	TOTAL PHENOLICS	FL
EPA 6010 C	ANTIMONY	FL
EPA 6010 C	BARIUM	FL
EPA 6010 C	BORON	FL
EPA 6010 C	CALCIUM	FL
EPA 6010 C	COBALT	FL
EPA 6010 C	IRON	FL
EPA 6010 C	MAGNESIUM	FL
EPA 6010 C	MOLYBDENUM	FL
EPA 6010 C	POTASSIUM	FL
EPA 6010 C	SILVER	FL
EPA 6010 C	THALLIUM	FL
EPA 6010 C	TITANIUM	FL
EPA 6010 C	ZINC	FL
EPA 6020 A	ARSENIC	FL
EPA 6020 A	BERYLLIUM	FL
EPA 6020 A	CHROMIUM	FL
EPA 6020 A	COPPER	FL
EPA 6020 A	MANGANESE	FL
EPA 6020 A	SELENIUM	FL
EPA 6020 A	THALLIUM	FL
EPA 6020 A	ZINC	FL
EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	FL
EPA 8081 B	4,4'-DDD	FL
EPA 8081 B	4,4'-DDT	FL
EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	FL

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	FL
EPA 8081 B	CHLORDANE (TECH.)	FL
EPA 8081 B	DIELDRIN	FL
EPA 8081 B	ENDOSULFAN II	FL
EPA 8081 B	ENDRIN	FL
EPA 8081 B	ENDRIN KETONE	FL
EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	FL
EPA 8081 B	HEPTACHLOR EPOXIDE	FL
EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	FL
EPA 8082 A	AROCLOR-1221 (PCB-1221)	FL
EPA 8082 A	AROCLOR-1242 (PCB-1242)	FL
EPA 8082 A	AROCLOR-1254 (PCB-1254)	FL
EPA 8151 A	2,4,5-T	FL
EPA 8151 A	2,4-DB	FL
EPA 8151 A	DALAPON	FL
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	FL
EPA 8151 A	PENTACHLOROPHENOL	FL
EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	FL
EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROPROPENE	FL
EPA 8260 B	1,2,3-TRICHLOROPROPANE	FL
EPA 8260 B	1,2,4-TRIMETHYLBENZENE	FL
EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	FL
EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	FL
EPA 8260 B	1,3,5-TRIMETHYLBENZENE	FL
EPA 8260 B	1,3-DICHLOROPROPANE	FL
EPA 8260 B	1,4-DIOXANE (P-DIOXANE /1,4-DIETHYLENEOXIDE)	FL
EPA 8260 B	2,2-DICHLOROPROPANE	FL
EPA 8260 B	2-CHLOROETHYL VINYL ETHER	FL
EPA 8260 B	2-HEXANONE	FL

METHOD	ANALYTE	PRIMARY
EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	DELTA-BHC	FL
EPA 8081 B	ENDOSULFAN I	FL
EPA 8081 B	ENDOSULFAN SULFATE	FL
EPA 8081 B	ENDRIN ALDEHYDE	FL
EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	FL
EPA 8081 B	HEPTACHLOR	FL
EPA 8081 B	METHOXYCHLOR	FL
EPA 8082 A	AROCLOR-1016 (PCB-1016)	FL
EPA 8082 A	AROCLOR-1232 (PCB-1232)	FL
EPA 8082 A	AROCLOR-1248 (PCB-1248)	FL
EPA 8082 A	AROCLOR-1260 (PCB-1260)	FL
EPA 8151 A	2,4-D	FL
EPA 8151 A	4-NITROPHENOL	FL
EPA 8151 A	DICAMBA	FL
EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	FL
EPA 8151 A	SILVEX (2,4,5-TP)	FL
EPA 8260 B	1,1,1-TRICHLOROETHANE	FL
EPA 8260 B	1,1,2-TRICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHYLENE	FL
EPA 8260 B	1,2,3-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,4-TRICHLOROBENZENE	FL
EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	FL
EPA 8260 B	1,2-DICHLOROBENZENE	FL
EPA 8260 B	1,2-DICHLOROPROPANE	FL
EPA 8260 B	1,3-DICHLOROBENZENE	FL
EPA 8260 B	1,4-DICHLOROBENZENE	FL
EPA 8260 B	1-CHLOROHEXANE	FL
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	FL
EPA 8260 B	2-CHLOROTOLUENE	FL
EPA 8260 B	4-CHLOROTOLUENE	FL

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY
EPA 8260 B	4-METHYL-2-PENTANONE (METHYL ISOBUTYL KETONE, MIBK)	FL
EPA 8260 B	ACETONITRILE	FL
EPA 8260 B	ACRYLONITRILE	FL
EPA 8260 B	BENZENE	FL
EPA 8260 B	BROMOCHLOROMETHANE	FL
EPA 8260 B	BROMOFORM	FL
EPA 8260 B	CARBON TETRACHLORIDE	FL
EPA 8260 B	CHLORODIBROMOMETHANE	FL
EPA 8260 B	CHLOROFORM	FL
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	FL
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	FL
EPA 8260 B	ETHYLBENZENE	FL
EPA 8260 B	IODOMETHANE (METHYL IODIDE)	FL
EPA 8260 B	ISOPROPYLBENZENE	FL
EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	FL
EPA 8260 B	METHYL METHACRYLATE	FL
EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	FL
EPA 8260 B	N-PROPYLBENZENE	FL
EPA 8260 B	PENTACHLOROETHANE	FL
EPA 8260 B	SEC-BUTYLBENZENE	FL
EPA 8260 B	TERT-BUTYLBENZENE	FL
EPA 8260 B	TOLUENE	FL
EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	FL
EPA 8260 B	VINYL ACETATE	FL
EPA 8260 B	XYLENE (TOTAL)	FL
EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	FL
EPA 8270 D	1,2-DICHLOROBENZENE	FL
EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8270 D	1,4-NAPHTHOQUINONE	FL
EPA 8260 B	ACETONE	FL
EPA 8260 B	ACROLEIN (PROPENAL)	FL
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	FL
EPA 8260 B	BROMOBENZENE	FL
EPA 8260 B	BROMODICHLOROMETHANE	FL
EPA 8260 B	CARBON DISULFIDE	FL
EPA 8260 B	CHLOROBENZENE	FL
EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	FL
EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	FL
EPA 8260 B	CIS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	ETHYL METHACRYLATE	FL
EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL
EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	FL
EPA 8260 B	METHACRYLONITRILE	FL
EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	FL
EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	FL
EPA 8260 B	N-BUTYLBENZENE	FL
EPA 8260 B	NAPHTHALENE	FL
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	FL
EPA 8260 B	STYRENE	FL
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	FL
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	FL
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	FL
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	FL
EPA 8260 B	VINYL CHLORIDE	FL
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	FL
EPA 8270 D	1,2,4-TRICHLOROBENZENE	FL
EPA 8270 D	1,2-DIPHENYLHYDRAZINE	FL
EPA 8270 D	1,3-DICHLOROBENZENE	FL
EPA 8270 D	1,4-DICHLOROBENZENE	FL
EPA 8270 D	1,4-PHENYLENEDIAMINE	FL

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY
EPA 8270 D	1-NAPHTHYLAMINE	FL
EPA 8270 D	2,4,5-TRICHLOROPHENOL	FL
EPA 8270 D	2,4-DICHLOROPHENOL	FL
EPA 8270 D	2,4-DINITROPHENOL	FL
EPA 8270 D	2,6-DICHLOROPHENOL	FL
EPA 8270 D	2-ACETYLAMINOFLUORENE	FL
EPA 8270 D	2-CHLOROPHENOL	FL
EPA 8270 D	2-METHYLNAPHTHALENE	FL
EPA 8270 D	2-NAPHTHYLAMINE	FL
EPA 8270 D	2-NITROPHENOL	FL
EPA 8270 D	3,3'-DICHLOROBENZIDINE	FL
EPA 8270 D	3-METHYLCHOLANTHRENE	FL
EPA 8270 D	4-AMINOBIPHENYL	FL
EPA 8270 D	4-CHLORO-3-METHYLPHENOL	FL
EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	FL
EPA 8270 D	4-NITROANILINE	FL
EPA 8270 D	4-NITROQUINOLINE-1-OXIDE	FL
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	FL
EPA 8270 D	ACENAPHTHENE	FL
EPA 8270 D	ACETOPHENONE	FL
EPA 8270 D	ANTHRACENE	FL
EPA 8270 D	BENZIDINE	FL
EPA 8270 D	BENZO(A)PYRENE	FL
EPA 8270 D	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D	BENZOIC ACID	FL
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	FL
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	FL
EPA 8270 D	BUTYL BENZYL PHTHALATE	FL
EPA 8270 D	CHRYSENE	FL
EPA 8270 D	DI-N-OCTYL PHTHALATE	FL
EPA 8270 D	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D	DIETHYL PHTHALATE	FL
EPA 8270 D	DIMETHYL PHTHALATE	FL
EPA 8270 D	ETHYL METHANESULFONATE	FL
EPA 8270 D	FLUORANTHENE	FL
EPA 8270 D	HEXACHLOROBENZENE	FL

METHOD	ANALYTE	PRIMARY
EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	FL
EPA 8270 D	2,4,6-TRICHLOROPHENOL	FL
EPA 8270 D	2,4-DIMETHYLPHENOL	FL
EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	FL
EPA 8270 D	2-CHLORONAPHTHALENE	FL
EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	FL
EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	FL
EPA 8270 D	2-NITROANILINE	FL
EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	FL
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	FL
EPA 8270 D	3-NITROANILINE	FL
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	FL
EPA 8270 D	4-CHLOROANILINE	FL
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	FL
EPA 8270 D	4-NITROPHENOL	FL
EPA 8270 D	5-NITRO-O-TOLUIDINE	FL
EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	FL
EPA 8270 D	ACENAPHTHYLENE	FL
EPA 8270 D	ANILINE	FL
EPA 8270 D	ARAMITE	FL
EPA 8270 D	BENZO(A)ANTHRACENE	FL
EPA 8270 D	BENZO(B)FLUORANTHENE	FL
EPA 8270 D	BENZO(K)FLUORANTHENE	FL
EPA 8270 D	BENZYL ALCOHOL	FL
EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	FL
EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	FL
EPA 8270 D	CHLOROBENZILATE	FL
EPA 8270 D	DI-N-BUTYL PHTHALATE	FL
EPA 8270 D	DIALLATE	FL
EPA 8270 D	DIBENZOFURAN	FL
EPA 8270 D	DIMETHOATE	FL
EPA 8270 D	DISULFOTON	FL
EPA 8270 D	FAMPHUR	FL
EPA 8270 D	FLUORENE	FL
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL

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METHOD	ANALYTE	PRIMARY
EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	FL
EPA 8270 D	HEXACHLOROPHENE	FL
EPA 8270 D	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D	ISOPHORONE	FL
EPA 8270 D	KEPONE	FL
EPA 8270 D	METHYL METHANESULFONATE	FL
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	FL
EPA 8270 D	N-NITROSODIETHYLAMINE	FL
EPA 8270 D	N-NITROSODIPHENYLAMINE	FL
EPA 8270 D	N-NITROSOMORPHOLINE	FL
EPA 8270 D	N-NITROSOPYRROLIDINE	FL
EPA 8270 D	NITROBENZENE	FL
EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	FL
EPA 8270 D	PENTACHLOROBENZENE	FL
EPA 8270 D	PENTACHLOROPHENOL	FL
EPA 8270 D	PHENANTHRENE	FL
EPA 8270 D	PHORATE	FL
EPA 8270 D	PYRENE	FL
EPA 8270 D	SULFOTEPP (TETRAETHYL DITHIOPYROPHOSPHATE)	FL
EPA 8270 D - EXTENDED	2,2'-OXYBIS(1-CHLOROPROPANE) / BIS(2-CHLOROISOPROPYL ETHER)	FL
EPA 8270 D - EXTENDED	CARBAZOLE	FL
EPA 8270 D SIM	2-METHYLNAPHTHALENE	FL
EPA 8270 D SIM	ACENAPHTHYLENE	FL
EPA 8270 D SIM	BENZO(A)ANTHRACENE	FL
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	FL
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	FL
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D SIM	FLUORENE	FL
EPA 8270 D SIM	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL
EPA 8270 D SIM	NAPHTHALENE	FL
EPA 8270 D SIM	PHENANTHRENE	FL
EPA 8310	ACENAPHTHENE	FL
EPA 8310	ANTHRACENE	FL
EPA 8310	BENZO(A)PYRENE	FL
EPA 8310	BENZO(G,H,I)PERYLENE	FL
EPA 8310	CHRYSENE	FL

METHOD	ANALYTE	PRIMARY
EPA 8270 D	HEXACHLOROETHANE	FL
EPA 8270 D	HEXACHLOROPROPENE	FL
EPA 8270 D	ISODRIN	FL
EPA 8270 D	ISOSAFROLE	FL
EPA 8270 D	METHAPYRILENE	FL
EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	FL
EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	FL
EPA 8270 D	N-NITROSODIMETHYLAMINE	FL
EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	FL
EPA 8270 D	N-NITROSOPIPERIDINE	FL
EPA 8270 D	NAPHTHALENE	FL
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	FL
EPA 8270 D	PARATHION (PARATHION - ETHYL)	FL
EPA 8270 D	PENTACHLORONITROBENZENE	FL
EPA 8270 D	PHENACETIN	FL
EPA 8270 D	PHENOL	FL
EPA 8270 D	PRONAMIDE (KERB)	FL
EPA 8270 D	SAFROLE	FL
EPA 8270 D	THIONAZIN (ZINOPHOS)	FL
EPA 8270 D - EXTENDED	3+4-METHYLPHENOL (M+P CRESOL)	FL
EPA 8270 D - EXTENDED	PYRIDINE	FL
EPA 8270 D SIM	ACENAPHTHENE	FL
EPA 8270 D SIM	ANTHRACENE	FL
EPA 8270 D SIM	BENZO(A)PYRENE	FL
EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D SIM	CHRYSENE	FL
EPA 8270 D SIM	FLUORANTHENE	FL
EPA 8270 D SIM	HEXACHLOROBENZENE	FL
EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D SIM	PENTACHLOROPHENOL	FL
EPA 8270 D SIM	PYRENE	FL
EPA 8310	ACENAPHTHYLENE	FL
EPA 8310	BENZO(A)ANTHRACENE	FL
EPA 8310	BENZO(B)FLUORANTHENE	FL
EPA 8310	BENZO(K)FLUORANTHENE	FL
EPA 8310	DIBENZO(A,H) ANTHRACENE	FL

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8310	FLUORANTHENE	FL	EPA 8310	FLUORENE	FL
EPA 8310	INDENO(1,2,3-CD) PYRENE	FL	EPA 8310	NAPHTHALENE	FL
EPA 8310	PHENANTHRENE	FL	EPA 8310	PYRENE	FL
EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL	EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL	EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	FL	EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL
EPA 8330 A	2-NITROTOLUENE	FL	EPA 8330 A	3-NITROTOLUENE	FL
EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL	EPA 8330 A	4-NITROTOLUENE	FL
EPA 8330 A	NITROBENZENE	FL	EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	FL
EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL	EPA 8330 B	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8330 B	1,3-DINITROBENZENE (1,3-DNB)	FL	EPA 8330 B	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL
EPA 8330 B	2,4-DINITROTOLUENE (2,4-DNT)	FL	EPA 8330 B	2,6-DINITROTOLUENE (2,6-DNT)	FL
EPA 8330 B	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL	EPA 8330 B	2-NITROTOLUENE	FL
EPA 8330 B	3-NITROTOLUENE	FL	EPA 8330 B	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL
EPA 8330 B	4-NITROTOLUENE	FL	EPA 8330 B	NITROBENZENE	FL
EPA 8330 B	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	FL	EPA 8330 B	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL
EPA 8332	NITROGLYCERIN	FL	EPA 9010 B	PREP: CYANIDE DISTILLATION	FL
EPA 9010 C	PREP: CYANIDE DISTILLATION	FL	EPA 9012 A	AMENABLE CYANIDE	FL
EPA 9012 A	TOTAL CYANIDE	FL	EPA 9012 B	AMENABLE CYANIDE	FL
EPA 9012 B	TOTAL CYANIDE	FL	EPA 9040 B	PH	FL
EPA 9040 C	PH	FL	SM 2540 B-2011	RESIDUE-TOTAL	FL
SM 2540 C-2011	RESIDUE-FILTERABLE (TDS)	FL	SM 2540 D-2011	RESIDUE-NONFILTERABLE (TSS)	FL
SM 4500-CN⁻ G-2011	AMENABLE CYANIDE	FL	SM 4500-S2⁻ F-2011	SULFIDE	FL
SM 5310 B-2011	TOTAL ORGANIC CARBON	FL			

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	FL	EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	FL
EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	FL	EPA 6010 C	ALUMINUM	FL
EPA 6010 C	ANTIMONY	FL	EPA 6010 C	ARSENIC	FL
EPA 6010 C	BARIUM	FL	EPA 6010 C	BERYLLIUM	FL
EPA 6010 C	BORON	FL	EPA 6010 C	CADMIUM	FL

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 6010 C	CALCIUM	FL	EPA 6010 C	CHROMIUM	FL
EPA 6010 C	COBALT	FL	EPA 6010 C	COPPER	FL
EPA 6010 C	IRON	FL	EPA 6010 C	LEAD	FL
EPA 6010 C	MAGNESIUM	FL	EPA 6010 C	MANGANESE	FL
EPA 6010 C	MOLYBDENUM	FL	EPA 6010 C	NICKEL	FL
EPA 6010 C	POTASSIUM	FL	EPA 6010 C	SELENIUM	FL
EPA 6010 C	SILVER	FL	EPA 6010 C	SODIUM	FL
EPA 6010 C	THALLIUM	FL	EPA 6010 C	TIN	FL
EPA 6010 C	TITANIUM	FL	EPA 6010 C	VANADIUM	FL
EPA 6010 C	ZINC	FL	EPA 6020 A	ANTIMONY	FL
EPA 6020 A	ARSENIC	FL	EPA 6020 A	BARIUM	FL
EPA 6020 A	BERYLLIUM	FL	EPA 6020 A	CADMIUM	FL
EPA 6020 A	CHROMIUM	FL	EPA 6020 A	COBALT	FL
EPA 6020 A	COPPER	FL	EPA 6020 A	LEAD	FL
EPA 6020 A	MANGANESE	FL	EPA 6020 A	NICKEL	FL
EPA 6020 A	SELENIUM	FL	EPA 6020 A	SILVER	FL
EPA 6020 A	THALLIUM	FL	EPA 6020 A	VANADIUM	FL
EPA 6020 A	ZINC	FL	EPA 7196 A	CHROMIUM VI	FL
EPA 7471 A	MERCURY	FL	EPA 7471 B	MERCURY	FL
EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	FL	EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	FL
EPA 8081 B	4,4'-DDD	FL	EPA 8081 B	4,4'-DDE	FL
EPA 8081 B	4,4'-DDT	FL	EPA 8081 B	ALDRIN	FL
EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	FL	EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	FL
EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	FL	EPA 8081 B	CHLORDANE (TECH.)	FL
EPA 8081 B	DELTA-BHC	FL	EPA 8081 B	DIELDRIN	FL
EPA 8081 B	ENDOSULFAN I	FL	EPA 8081 B	ENDOSULFAN II	FL
EPA 8081 B	ENDOSULFAN SULFATE	FL	EPA 8081 B	ENDRIN	FL
EPA 8081 B	ENDRIN ALDEHYDE	FL	EPA 8081 B	ENDRIN KETONE	FL
EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	FL	EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	FL
EPA 8081 B	HEPTACHLOR	FL	EPA 8081 B	HEPTACHLOR EPOXIDE	FL
EPA 8081 B	METHOXYCHLOR	FL	EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	FL
EPA 8082 A	AROCLOR-1016 (PCB-1016)	FL	EPA 8082 A	AROCLOR-1221 (PCB-1221)	FL
EPA 8082 A	AROCLOR-1232 (PCB-1232)	FL	EPA 8082 A	AROCLOR-1242 (PCB-1242)	FL
EPA 8082 A	AROCLOR-1248 (PCB-1248)	FL	EPA 8082 A	AROCLOR-1254 (PCB-1254)	FL

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EPA 8082 A	AROCLOR-1260 (PCB-1260)	FL
EPA 8151 A	2,4-D	FL
EPA 8151 A	4-NITROPHENOL	FL
EPA 8151 A	DICAMBA	FL
EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	FL
EPA 8151 A	SILVEX (2,4,5-TP)	FL
EPA 8260 B	1,1,1-TRICHLOROETHANE	FL
EPA 8260 B	1,1,2-TRICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHYLENE	FL
EPA 8260 B	1,2,3-TRICHLOROBENZENE	FL
EPA 8260 B	1,2,4-TRICHLOROBENZENE	FL
EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	FL
EPA 8260 B	1,2-DICHLOROBENZENE	FL
EPA 8260 B	1,2-DICHLOROPROPANE	FL
EPA 8260 B	1,3-DICHLOROBENZENE	FL
EPA 8260 B	1,4-DICHLOROBENZENE	FL
EPA 8260 B	1-CHLOROHEXANE	FL
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	FL
EPA 8260 B	2-CHLOROTOLUENE	FL
EPA 8260 B	4-CHLOROTOLUENE	FL
EPA 8260 B	ACETONE	FL
EPA 8260 B	ACROLEIN (PROPENAL)	FL
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	FL
EPA 8260 B	BROMOBENZENE	FL
EPA 8260 B	BROMODICHLOROMETHANE	FL
EPA 8260 B	CARBON DISULFIDE	FL
EPA 8260 B	CHLOROBENZENE	FL
EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	FL
EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	FL
EPA 8260 B	CIS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	FL
EPA 8260 B	ETHYLBENZENE	FL
EPA 8151 A	2,4,5-T	FL
EPA 8151 A	2,4-DB	FL
EPA 8151 A	DALAPON	FL
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	FL
EPA 8151 A	PENTACHLOROPHENOL	FL
EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	FL
EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROETHANE	FL
EPA 8260 B	1,1-DICHLOROPROPENE	FL
EPA 8260 B	1,2,3-TRICHLOROPROPANE	FL
EPA 8260 B	1,2,4-TRIMETHYLBENZENE	FL
EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	FL
EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	FL
EPA 8260 B	1,3,5-TRIMETHYLBENZENE	FL
EPA 8260 B	1,3-DICHLOROPROPANE	FL
EPA 8260 B	1,4-DIOXANE (P-DIOXANE /1,4-DIETHYLENEOXIDE)	FL
EPA 8260 B	2,2-DICHLOROPROPANE	FL
EPA 8260 B	2-CHLOROETHYL VINYL ETHER	FL
EPA 8260 B	2-HEXANONE	FL
EPA 8260 B	4-METHYL-2-PENTANONE (METHYL ISOBUTYL KETONE, MIBK)	FL
EPA 8260 B	ACETONITRILE	FL
EPA 8260 B	ACRYLONITRILE	FL
EPA 8260 B	BENZENE	FL
EPA 8260 B	BROMOCHLOROMETHANE	FL
EPA 8260 B	BROMOFORM	FL
EPA 8260 B	CARBON TETRACHLORIDE	FL
EPA 8260 B	CHLORODIBROMOMETHANE	FL
EPA 8260 B	CHLOROFORM	FL
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	FL
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	FL
EPA 8260 B	ETHYL METHACRYLATE	FL
EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL

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EPA 8260 B	IODOMETHANE (METHYL IODIDE)	FL
EPA 8260 B	ISOPROPYLBENZENE	FL
EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	FL
EPA 8260 B	METHYL METHACRYLATE	FL
EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	FL
EPA 8260 B	N-PROPYLBENZENE	FL
EPA 8260 B	PENTACHLOROETHANE	FL
EPA 8260 B	SEC-BUTYLBENZENE	FL
EPA 8260 B	TERT-BUTYLBENZENE	FL
EPA 8260 B	TOLUENE	FL
EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	FL
EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	FL
EPA 8260 B	VINYL ACETATE	FL
EPA 8260 B	XYLENE (TOTAL)	FL
EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	FL
EPA 8270 D	1,2-DICHLOROBENZENE	FL
EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8270 D	1,4-NAPHTHOQUINONE	FL
EPA 8270 D	1-NAPHTHYLAMINE	FL
EPA 8270 D	2,4,5-TRICHLOROPHENOL	FL
EPA 8270 D	2,4-DICHLOROPHENOL	FL
EPA 8270 D	2,4-DINITROPHENOL	FL
EPA 8270 D	2,6-DICHLOROPHENOL	FL
EPA 8270 D	2-ACETYLAMINOFLUORENE	FL
EPA 8270 D	2-CHLOROPHENOL	FL
EPA 8270 D	2-METHYLNAPHTHALENE	FL
EPA 8270 D	2-NAPHTHYLAMINE	FL
EPA 8270 D	2-NITROPHENOL	FL
EPA 8270 D	3,3'-DICHLOROBENZIDINE	FL
EPA 8270 D	3-METHYLCHOLANTHRENE	FL
EPA 8270 D	4-AMINOBIPHENYL	FL
EPA 8270 D	4-CHLORO-3-METHYLPHENOL	FL
EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	FL
EPA 8260 B	METHACRYLONITRILE	FL
EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	FL
EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	FL
EPA 8260 B	N-BUTYLBENZENE	FL
EPA 8260 B	NAPHTHALENE	FL
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	FL
EPA 8260 B	STYRENE	FL
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	FL
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	FL
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	FL
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	FL
EPA 8260 B	VINYL CHLORIDE	FL
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	FL
EPA 8270 D	1,2,4-TRICHLOROBENZENE	FL
EPA 8270 D	1,2-DIPHENYLHYDRAZINE	FL
EPA 8270 D	1,3-DICHLOROBENZENE	FL
EPA 8270 D	1,4-DICHLOROBENZENE	FL
EPA 8270 D	1,4-PHENYLENEDIAMINE	FL
EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	FL
EPA 8270 D	2,4,6-TRICHLOROPHENOL	FL
EPA 8270 D	2,4-DIMETHYLPHENOL	FL
EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	FL
EPA 8270 D	2-CHLORONAPHTHALENE	FL
EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	FL
EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	FL
EPA 8270 D	2-NITROANILINE	FL
EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	FL
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	FL
EPA 8270 D	3-NITROANILINE	FL
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	FL
EPA 8270 D	4-CHLOROANILINE	FL

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EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	FL
EPA 8270 D	4-NITROANILINE	FL
EPA 8270 D	4-NITROQUINOLINE-1-OXIDE	FL
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	FL
EPA 8270 D	ACENAPHTHENE	FL
EPA 8270 D	ACETOPHENONE	FL
EPA 8270 D	ANTHRACENE	FL
EPA 8270 D	BENZIDINE	FL
EPA 8270 D	BENZO(A)PYRENE	FL
EPA 8270 D	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D	BENZOIC ACID	FL
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	FL
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	FL
EPA 8270 D	BUTYL BENZYL PHTHALATE	FL
EPA 8270 D	CHRYSENE	FL
EPA 8270 D	DI-N-OCTYL PHTHALATE	FL
EPA 8270 D	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D	DIETHYL PHTHALATE	FL
EPA 8270 D	DIMETHYL PHTHALATE	FL
EPA 8270 D	ETHYL METHANESULFONATE	FL
EPA 8270 D	FLUORANTHENE	FL
EPA 8270 D	HEXACHLOROBENZENE	FL
EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	FL
EPA 8270 D	HEXACHLOROPHENE	FL
EPA 8270 D	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D	ISOPHORONE	FL
EPA 8270 D	KEPONE	FL
EPA 8270 D	METHYL METHANESULFONATE	FL
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	FL
EPA 8270 D	N-NITROSODIETHYLAMINE	FL
EPA 8270 D	N-NITROSODIPHENYLAMINE	FL
EPA 8270 D	N-NITROSOMORPHOLINE	FL
EPA 8270 D	N-NITROSOPYRROLIDINE	FL
EPA 8270 D	NITROBENZENE	FL
EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	FL
EPA 8270 D	PENTACHLOROBENZENE	FL
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	FL
EPA 8270 D	4-NITROPHENOL	FL
EPA 8270 D	5-NITRO-O-TOLUIDINE	FL
EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	FL
EPA 8270 D	ACENAPHTHYLENE	FL
EPA 8270 D	ANILINE	FL
EPA 8270 D	ARAMITE	FL
EPA 8270 D	BENZO(A)ANTHRACENE	FL
EPA 8270 D	BENZO(B)FLUORANTHENE	FL
EPA 8270 D	BENZO(K)FLUORANTHENE	FL
EPA 8270 D	BENZYL ALCOHOL	FL
EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	FL
EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	FL
EPA 8270 D	CHLOROBENZILATE	FL
EPA 8270 D	DI-N-BUTYL PHTHALATE	FL
EPA 8270 D	DIALLATE	FL
EPA 8270 D	DIBENZOFURAN	FL
EPA 8270 D	DIMETHOATE	FL
EPA 8270 D	DISULFOTON	FL
EPA 8270 D	FAMPHUR	FL
EPA 8270 D	FLUORENE	FL
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL
EPA 8270 D	HEXACHLOROETHANE	FL
EPA 8270 D	HEXACHLOROPROPENE	FL
EPA 8270 D	ISODRIN	FL
EPA 8270 D	ISOSAFROLE	FL
EPA 8270 D	METHAPYRILENE	FL
EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	FL
EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	FL
EPA 8270 D	N-NITROSODIMETHYLAMINE	FL
EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	FL
EPA 8270 D	N-NITROSOPIPERIDINE	FL
EPA 8270 D	NAPHTHALENE	FL
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	FL
EPA 8270 D	PARATHION (PARATHION - ETHYL)	FL

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 8053

Compuchem, A Division of Liberty Analytical
501 Madison Avenue
Cary, NC 27513

Virginia Laboratory ID: 460188
Effective Date: September 15, 2015
Expiration Date: September 14, 2016

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY
EPA 8270 D	PENTACHLORONITROBENZENE	FL
EPA 8270 D	PHENACETIN	FL
EPA 8270 D	PHENOL	FL
EPA 8270 D	PRONAMIDE (KERB)	FL
EPA 8270 D	SAFROLE	FL
EPA 8270 D	THIONAZIN (ZINOPHOS)	FL
EPA 8270 D - EXTENDED	3+4-METHYLPHENOL (M+P CRESOL)	FL
EPA 8270 D - EXTENDED	PYRIDINE	FL
EPA 8270 D SIM	ACENAPHTHENE	FL
EPA 8270 D SIM	ANTHRACENE	FL
EPA 8270 D SIM	BENZO(A)PYRENE	FL
EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	FL
EPA 8270 D SIM	CHRYSENE	FL
EPA 8270 D SIM	FLUORANTHENE	FL
EPA 8270 D SIM	HEXACHLOROBENZENE	FL
EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	FL
EPA 8270 D SIM	PENTACHLOROPHENOL	FL
EPA 8270 D SIM	PYRENE	FL
EPA 8310	ACENAPHTHYLENE	FL
EPA 8310	BENZO(A)ANTHRACENE	FL
EPA 8310	BENZO(B)FLUORANTHENE	FL
EPA 8310	BENZO(K)FLUORANTHENE	FL
EPA 8310	DIBENZO(A,H) ANTHRACENE	FL
EPA 8310	FLUORENE	FL
EPA 8310	NAPHTHALENE	FL
EPA 8310	PYRENE	FL
EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	FL
EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	FL
EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	FL
EPA 8330 A	3-NITROTOLUENE	FL
EPA 8330 A	4-NITROTOLUENE	FL
EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	FL
EPA 8332	NITROGLYCERIN	FL
EPA 9010 C	PREP: CYANIDE DISTILLATION	FL
EPA 8270 D	PENTACHLOROPHENOL	FL
EPA 8270 D	PHENANTHRENE	FL
EPA 8270 D	PHORATE	FL
EPA 8270 D	PYRENE	FL
EPA 8270 D	SULFOTEPP (TETRAETHYL DITHIOPYROPHOSPHATE)	FL
EPA 8270 D - EXTENDED	2,2'-OXYBIS(1-CHLOROPROPANE) / BIS(2-CHLOROISOPROPYL ETHER)	FL
EPA 8270 D - EXTENDED	CARBAZOLE	FL
EPA 8270 D SIM	2-METHYLNAPHTHALENE	FL
EPA 8270 D SIM	ACENAPHTHYLENE	FL
EPA 8270 D SIM	BENZO(A)ANTHRACENE	FL
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	FL
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	FL
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	FL
EPA 8270 D SIM	FLUORENE	FL
EPA 8270 D SIM	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	FL
EPA 8270 D SIM	NAPHTHALENE	FL
EPA 8270 D SIM	PHENANTHRENE	FL
EPA 8310	ACENAPHTHENE	FL
EPA 8310	ANTHRACENE	FL
EPA 8310	BENZO(A)PYRENE	FL
EPA 8310	BENZO(G,H,I)PERYLENE	FL
EPA 8310	CHRYSENE	FL
EPA 8310	FLUORANTHENE	FL
EPA 8310	INDENO(1,2,3-CD) PYRENE	FL
EPA 8310	PHENANTHRENE	FL
EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	FL
EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	FL
EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	FL
EPA 8330 A	2-NITROTOLUENE	FL
EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	FL
EPA 8330 A	NITROBENZENE	FL
EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	FL
EPA 9010 B	PREP: CYANIDE DISTILLATION	FL
EPA 9012 A	CYANIDE	FL

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 8053

Compuchem, A Division of Liberty Analytical
501 Madison Avenue
Cary, NC 27513

Virginia Laboratory ID: 460188
Effective Date: September 15, 2015
Expiration Date: September 14, 2016

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 9012 B	TOTAL CYANIDE	FL	EPA 9045 C	PH	FL
EPA 9060 A	TOTAL ORGANIC CARBON	FL	EPA 9071 B	OIL AND GREASE (AS HEM)	FL

This Scope of Accreditation must accompany the Certificate issued by Virginia DCLS with the same Certificate Number indicated above.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF GENERAL SERVICES
DIVISION OF CONSOLIDATED LABORATORY SERVICES

Certifies that

VA Laboratory ID#: 460182
Eurofins Lancaster Laboratories Environmental, LLC

2425 New Holland Pike
Lancaster, PA 17601

Owner: EUROFINS SCIENTIFIC
Responsible Official: DUANE LUCKENBILL

Having met the requirements of 1 VAC 30-46
and the National Environmental Laboratory Accreditation Conference 2003 Standard
is hereby approved as an

Accredited Laboratory

As more fully described in the attached Scope of Accreditation

BOD - sm5210B
checked. JCF

Effective Date: **June 15, 2015**
Expiration Date: **June 14, 2016**
Certificate # 7815

Denise M. Toney

Denise M. Toney, Ph.D., HCLD
DGS Deputy Director for Laboratories

Continued accreditation status depends on successful ongoing participation in the program.
Certificate to be conspicuously displayed at the laboratory.
Not valid unless accompanied by a valid Virginia Environmental Laboratory Accreditation Program (VELAP) Scope of Accreditation.
Customers are urged to verify the laboratory's current accreditation status.

Certificate Not Transferable

Surrender Upon Revocation

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 7815

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

AIR

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA TO-14A 2nd Ed.	1,1,1-TRICHLOROETHANE	LA DEQ	EPA TO-14A 2nd Ed.	1,1,2,2-TETRACHLOROETHANE	LA DEQ
EPA TO-14A 2nd Ed.	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	LA DEQ	EPA TO-14A 2nd Ed.	1,1,2-TRICHLOROETHANE	LA DEQ
EPA TO-14A 2nd Ed.	1,1-DICHLOROETHANE	LA DEQ	EPA TO-14A 2nd Ed.	1,1-DICHLOROETHYLENE	LA DEQ
EPA TO-14A 2nd Ed.	1,2,4-TRICHLOROBENZENE	LA DEQ	EPA TO-14A 2nd Ed.	1,2,4-TRIMETHYLBENZENE	LA DEQ
EPA TO-14A 2nd Ed.	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	LA DEQ	EPA TO-14A 2nd Ed.	1,2-DICHLOROBENZENE	LA DEQ
EPA TO-14A 2nd Ed.	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	LA DEQ	EPA TO-14A 2nd Ed.	1,2-DICHLOROPROPANE	LA DEQ
EPA TO-14A 2nd Ed.	1,3,5-TRIMETHYLBENZENE	LA DEQ	EPA TO-14A 2nd Ed.	1,3-DICHLOROBENZENE	LA DEQ
EPA TO-14A 2nd Ed.	1,4-DICHLOROBENZENE	LA DEQ	EPA TO-14A 2nd Ed.	2-BUTANONE (METHYL ETHYL KETONE, MEK)	LA DEQ
EPA TO-14A 2nd Ed.	BENZENE	LA DEQ	EPA TO-14A 2nd Ed.	BROMOFORM	LA DEQ
EPA TO-14A 2nd Ed.	CARBON TETRACHLORIDE	LA DEQ	EPA TO-14A 2nd Ed.	CHLOROBENZENE	LA DEQ
EPA TO-14A 2nd Ed.	CHLOROETHANE (ETHYL CHLORIDE)	LA DEQ	EPA TO-14A 2nd Ed.	CHLOROFORM	LA DEQ
EPA TO-14A 2nd Ed.	CIS-1,2-DICHLOROETHYLENE	LA DEQ	EPA TO-14A 2nd Ed.	CIS-1,3-DICHLOROPROPENE	LA DEQ
EPA TO-14A 2nd Ed.	ETHYLBENZENE	LA DEQ	EPA TO-14A 2nd Ed.	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	LA DEQ
EPA TO-14A 2nd Ed.	M+P-XYLENE	LA DEQ	EPA TO-14A 2nd Ed.	METHYL BROMIDE (BROMOMETHANE)	LA DEQ
EPA TO-14A 2nd Ed.	METHYL CHLORIDE (CHLOROMETHANE)	LA DEQ	EPA TO-14A 2nd Ed.	METHYLENE CHLORIDE (DICHLOROMETHANE)	LA DEQ
EPA TO-14A 2nd Ed.	O-XYLENE	LA DEQ	EPA TO-14A 2nd Ed.	STYRENE	LA DEQ
EPA TO-14A 2nd Ed.	TETRACHLOROETHENE (PERCHLOROETHENE)	LA DEQ	EPA TO-14A 2nd Ed.	TOLUENE	LA DEQ
EPA TO-14A 2nd Ed.	TRANS-1,2-DICHLOROETHENE	LA DEQ	EPA TO-14A 2nd Ed.	TRANS-1,3-DICHLOROPROPENE	LA DEQ
EPA TO-14A 2nd Ed.	TRICHLOROETHENE (TRICHLOROETHYLENE)	LA DEQ	EPA TO-14A 2nd Ed.	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	LA DEQ
EPA TO-14A 2nd Ed.	VINYL CHLORIDE	LA DEQ	EPA TO-14A 2nd Ed. - EXTENDED	4-METHYL-2-PENTANONE (MIBK)	LA DEQ
EPA TO-14A 2nd Ed. - EXTENDED	BROMODICHLOROMETHANE	LA DEQ	EPA TO-14A 2nd Ed. - EXTENDED	CARBON DISULFIDE	LA DEQ
EPA TO-14A 2nd Ed. - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	LA DEQ	EPA TO-14A 2nd Ed. - EXTENDED	XYLENE (TOTAL)	LA DEQ
EPA TO-15 2nd Ed.	1,1,1-TRICHLOROETHANE	LA DEQ	EPA TO-15 2nd Ed.	1,1,2,2-TETRACHLOROETHANE	LA DEQ
EPA TO-15 2nd Ed.	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	LA DEQ	EPA TO-15 2nd Ed.	1,1,2-TRICHLOROETHANE	LA DEQ
EPA TO-15 2nd Ed.	1,1-DICHLOROETHANE	LA DEQ	EPA TO-15 2nd Ed.	1,1-DICHLOROETHYLENE	LA DEQ
EPA TO-15 2nd Ed.	1,2,4-TRICHLOROBENZENE	LA DEQ	EPA TO-15 2nd Ed.	1,2,4-TRIMETHYLBENZENE	LA DEQ
EPA TO-15 2nd Ed.	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	LA DEQ	EPA TO-15 2nd Ed.	1,2-DICHLOROBENZENE	LA DEQ
EPA TO-15 2nd Ed.	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	LA DEQ	EPA TO-15 2nd Ed.	1,2-DICHLOROPROPANE	LA DEQ
EPA TO-15 2nd Ed.	1,3,5-TRIMETHYLBENZENE	LA DEQ	EPA TO-15 2nd Ed.	1,3-BUTADIENE	LA DEQ

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 7815

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

AIR

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA TO-15 2nd Ed.	1,3-DICHLOROBENZENE	LA DEQ	EPA TO-15 2nd Ed.	1,4-DICHLOROBENZENE	LA DEQ
EPA TO-15 2nd Ed.	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	LA DEQ	EPA TO-15 2nd Ed.	2-BUTANONE (METHYL ETHYL KETONE, MEK)	LA DEQ
EPA TO-15 2nd Ed.	4-METHYL-2-PENTANONE (MIBK)	LA DEQ	EPA TO-15 2nd Ed.	ACETONITRILE	LA DEQ
EPA TO-15 2nd Ed.	ACROLEIN (PROPENAL)	LA DEQ	EPA TO-15 2nd Ed.	ACRYLONITRILE	LA DEQ
EPA TO-15 2nd Ed.	ALLYL CHLORIDE (3-CHLOROPROPENE)	LA DEQ	EPA TO-15 2nd Ed.	BENZENE	LA DEQ
EPA TO-15 2nd Ed.	BROMODICHLOROMETHANE	LA DEQ	EPA TO-15 2nd Ed.	BROMOFORM	LA DEQ
EPA TO-15 2nd Ed.	CARBON DISULFIDE	LA DEQ	EPA TO-15 2nd Ed.	CARBON TETRACHLORIDE	LA DEQ
EPA TO-15 2nd Ed.	CHLOROBENZENE	LA DEQ	EPA TO-15 2nd Ed.	CHLOROETHANE (ETHYL CHLORIDE)	LA DEQ
EPA TO-15 2nd Ed.	CHLOROFORM	LA DEQ	EPA TO-15 2nd Ed.	CIS-1,2-DICHLOROETHYLENE	LA DEQ
EPA TO-15 2nd Ed.	CIS-1,3-DICHLOROPROPENE	LA DEQ	EPA TO-15 2nd Ed.	CYCLOHEXANE	LA DEQ
EPA TO-15 2nd Ed.	ETHYL ACRYLATE	LA DEQ	EPA TO-15 2nd Ed.	ETHYLBENZENE	LA DEQ
EPA TO-15 2nd Ed.	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	LA DEQ	EPA TO-15 2nd Ed.	HEXACHLOROETHANE	LA DEQ
EPA TO-15 2nd Ed.	IODOMETHANE (METHYL IODIDE)	LA DEQ	EPA TO-15 2nd Ed.	ISOPROPYLBENZENE	LA DEQ
EPA TO-15 2nd Ed.	M+P-XYLENE	LA DEQ	EPA TO-15 2nd Ed.	METHYL BROMIDE (BROMOMETHANE)	LA DEQ
EPA TO-15 2nd Ed.	METHYL CHLORIDE (CHLOROMETHANE)	LA DEQ	EPA TO-15 2nd Ed.	METHYL METHACRYLATE	LA DEQ
EPA TO-15 2nd Ed.	METHYL TERT-BUTYL ETHER (MTBE)	LA DEQ	EPA TO-15 2nd Ed.	METHYLENE CHLORIDE (DICHLOROMETHANE)	LA DEQ
EPA TO-15 2nd Ed.	O-XYLENE	LA DEQ	EPA TO-15 2nd Ed.	PROPYLENE	LA DEQ
EPA TO-15 2nd Ed.	STYRENE	LA DEQ	EPA TO-15 2nd Ed.	TETRACHLOROETHENE (PERCHLOROETHENE)	LA DEQ
EPA TO-15 2nd Ed.	TOLUENE	LA DEQ	EPA TO-15 2nd Ed.	TRANS-1,2-DICHLOROETHENE	LA DEQ
EPA TO-15 2nd Ed.	TRANS-1,3-DICHLOROPROPENE	LA DEQ	EPA TO-15 2nd Ed.	TRICHLOROETHENE (TRICHLOROETHYLENE)	LA DEQ
EPA TO-15 2nd Ed.	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	LA DEQ	EPA TO-15 2nd Ed.	VINYL ACETATE	LA DEQ
EPA TO-15 2nd Ed.	VINYL CHLORIDE	LA DEQ	EPA TO-15 2nd Ed.	XYLENE (TOTAL)	LA DEQ
EPA TO-15 2nd Ed. - EXTENDED	2-CHLOROTOLUENE	LA DEQ	EPA TO-15 2nd Ed. - EXTENDED	2-HEXANONE	LA DEQ
EPA TO-15 2nd Ed. - EXTENDED	4-ETHYLTOLUENE	LA DEQ	EPA TO-15 2nd Ed. - EXTENDED	ACETONE	LA DEQ
EPA TO-15 2nd Ed. - EXTENDED	CHLORODIFLUOROMETHANE (FREON-22)	LA DEQ	EPA TO-15 2nd Ed. - EXTENDED	NAPHTHALENE	LA DEQ
EPA TO-15 2nd Ed. - EXTENDED	TERT-BUTYL ALCOHOL	LA DEQ			

DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 200.7 REV 4.4	ALUMINUM	PA	EPA 200.7 REV 4.4	BARIUM	PA
EPA 200.7 REV 4.4	BERYLLIUM	PA			

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 7815

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 200.7 REV 4.4	CADMIUM	PA	EPA 200.7 REV 4.4	CALCIUM	PA
EPA 200.7 REV 4.4	CHROMIUM	PA	EPA 200.7 REV 4.4	COPPER	PA
EPA 200.7 REV 4.4	IRON	PA	EPA 200.7 REV 4.4	MAGNESIUM	PA
EPA 200.7 REV 4.4	MANGANESE	PA	EPA 200.7 REV 4.4	NICKEL	PA
EPA 200.7 REV 4.4	SILVER	PA	EPA 200.7 REV 4.4	SODIUM	PA
EPA 200.7 REV 4.4	ZINC	PA	EPA 200.8 REV 5.4	ANTIMONY	PA
EPA 200.8 REV 5.4	ARSENIC	PA	EPA 200.8 REV 5.4	BERYLLIUM	PA
EPA 200.8 REV 5.4	CADMIUM	PA	EPA 200.8 REV 5.4	CHROMIUM	PA
EPA 200.8 REV 5.4	COPPER	PA	EPA 200.8 REV 5.4	LEAD	PA
EPA 200.8 REV 5.4	NICKEL	PA	EPA 200.8 REV 5.4	SELENIUM	PA
EPA 200.8 REV 5.4	THALLIUM	PA	EPA 245.1 REV 3	MERCURY	PA
EPA 300.0 REV 2.1	CHLORIDE	PA	EPA 300.0 REV 2.1	FLUORIDE	PA
EPA 300.0 REV 2.1	NITRATE AS N	PA	EPA 300.0 REV 2.1	NITRITE AS N	PA
EPA 300.0 REV 2.1	SULFATE	PA	EPA 335.4 REV 1.0	CYANIDE	PA
EPA 353.2 REV 2	NITRATE AS N	PA	EPA 353.2 REV 2	NITRATE/NITRITE	PA
EPA 353.2 REV 2	NITRITE AS N	PA	EPA 504.1 REV 1.1	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 504.1 REV 1.1	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 507 REV 2.1	ALACHLOR	PA
EPA 507 REV 2.1	ATRAZINE	PA	EPA 507 REV 2.1	SIMAZINE	PA
EPA 508 REV 3.1	AROCLOR-1016 (PCB-1016)	PA	EPA 508 REV 3.1	AROCLOR-1221 (PCB-1221)	PA
EPA 508 REV 3.1	AROCLOR-1232 (PCB-1232)	PA	EPA 508 REV 3.1	AROCLOR-1242 (PCB-1242)	PA
EPA 508 REV 3.1	AROCLOR-1248 (PCB-1248)	PA	EPA 508 REV 3.1	AROCLOR-1254 (PCB-1254)	PA
EPA 508 REV 3.1	AROCLOR-1260 (PCB-1260)	PA	EPA 508 REV 3.1	CHLORDANE (TECH.)	PA
EPA 508 REV 3.1	ENDRIN	PA	EPA 508 REV 3.1	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA
EPA 508 REV 3.1	HEPTACHLOR	PA	EPA 508 REV 3.1	HEPTACHLOR EPOXIDE	PA
EPA 508 REV 3.1	HEXACHLOROBENZENE	PA	EPA 508 REV 3.1	HEXACHLOROCYCLOPENTADIENE	PA
EPA 508 REV 3.1	METHOXYCHLOR	PA	EPA 508 REV 3.1	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 515.1 REV 4	2,4-D	PA	EPA 515.1 REV 4	DALAPON	PA
EPA 515.1 REV 4	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 515.1 REV 4	PENTACHLOROPHENOL	PA
EPA 515.1 REV 4	PICLORAM	PA	EPA 515.1 REV 4	SILVEX (2,4,5-TP)	PA
EPA 524.2 REV 4.1	1,1,1-TRICHLOROETHANE	PA	EPA 524.2 REV 4.1	1,1,2-TRICHLOROETHANE	PA
EPA 524.2 REV 4.1	1,1-DICHLOROETHYLENE	PA	EPA 524.2 REV 4.1	1,2,4-TRICHLOROBENZENE	PA
EPA 524.2 REV 4.1	1,2-DICHLOROBENZENE	PA	EPA 524.2 REV 4.1	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 524.2 REV 4.1	1,2-DICHLOROPROPANE	PA	EPA 524.2 REV 4.1	1,4-DICHLOROBENZENE	PA
EPA 524.2 REV 4.1	BENZENE	PA	EPA 524.2 REV 4.1	BROMODICHLOROMETHANE	PA

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Lancaster, PA 17601

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DRINKING WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 524.2 REV 4.1	BROMOFORM	PA	EPA 524.2 REV 4.1	CARBON TETRACHLORIDE	PA
EPA 524.2 REV 4.1	CHLOROBENZENE	PA	EPA 524.2 REV 4.1	CHLORODIBROMOMETHANE	PA
EPA 524.2 REV 4.1	CHLOROFORM	PA	EPA 524.2 REV 4.1	CIS-1,2-DICHLOROETHYLENE	PA
EPA 524.2 REV 4.1	ETHYLBENZENE	PA	EPA 524.2 REV 4.1	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 524.2 REV 4.1	STYRENE	PA	EPA 524.2 REV 4.1	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 524.2 REV 4.1	TOLUENE	PA	EPA 524.2 REV 4.1	TOTAL TRIHALOMETHANES	VA
EPA 524.2 REV 4.1	TRANS-1,2-DICHLOROETHENE	PA	EPA 524.2 REV 4.1	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA
EPA 524.2 REV 4.1	VINYL CHLORIDE	PA	EPA 524.2 REV 4.1	XYLENE (TOTAL)	PA
EPA 525.2 REV 2	ALACHLOR	PA	EPA 525.2 REV 2	ATRAZINE	PA
EPA 525.2 REV 2	BENZO(A)PYRENE	PA	EPA 525.2 REV 2	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 525.2 REV 2	BIS(2-ETHYLHEXYL)ADIPATE (DI(2-ETHYLHEXYL)ADIPATE)	PA	EPA 525.2 REV 2	ENDRIN	PA
EPA 525.2 REV 2	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 525.2 REV 2	HEPTACHLOR	PA
EPA 525.2 REV 2	HEPTACHLOR EPOXIDE	PA	EPA 525.2 REV 2	HEXACHLOROBENZENE	PA
EPA 525.2 REV 2	HEXACHLOROCYCLOPENTADIENE	PA	EPA 525.2 REV 2	METHOXYCHLOR	PA
EPA 525.2 REV 2	SIMAZINE	PA	EPA 531.1 REV 3.1	CARBOFURAN (FURADEN)	PA
EPA 531.1 REV 3.1	OXAMYL	PA	SM 2130 B-2001	TURBIDITY	PA
SM 2320 B-1997	ALKALINITY AS CACO3	PA	SM 2510 B-1997	CONDUCTIVITY	PA
SM 2540 C-1997	RESIDUE-FILTERABLE (TDS)	PA	SM 4500-F⁻ C-1997	FLUORIDE	PA
SM 4500-H+ B-2000	PH	PA	SM 4500-P E-1999	ORTHOPHOSPHATE AS P	PA
SM 5540 C-2000	SURFACTANTS - MBAS	PA	SM 9215 B-1994	HETEROTROPHIC PLATE COUNT	PA
SM 9223 COLILERT P/A	ESCHERICHIA COLI	PA	SM 9223 COLILERT P/A	TOTAL COLIFORMS	PA

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010	FLASHPOINT	PA	EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	PA
EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	PA	EPA 160.4	RESIDUE-VOLATILE	PA
EPA 1613 B	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA	EPA 1613 B	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA
EPA 1613 B	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA	EPA 1613 B	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA
EPA 1613 B	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA	EPA 1613 B	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA
EPA 1613 B	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA	EPA 1613 B	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA

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EPA 1613 B	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA	EPA 1613 B	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA
EPA 1613 B	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (1,2,3,7,8,9-HXCDF)	PA	EPA 1613 B	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (1,2,3,7,8-PECDD)	PA
EPA 1613 B	1,2,3,7,8-PENTACHLORODIBENZOFURAN (1,2,3,7,8-PECDF)	PA	EPA 1613 B	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (2,3,4,6,7,8-HXCDF)	PA
EPA 1613 B	2,3,4,7,8-PENTACHLORODIBENZOFURAN	PA	EPA 1613 B	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA
EPA 1613 B	2,3,7,8-TETRACHLORODIBENZOFURAN (2,3,7,8-TCDF)	PA	EPA 1631 E	MERCURY	PA
EPA 1664 A	OIL AND GREASE (AS HEM)	PA	EPA 1664 A	TOTAL PETROLEUM HYDROCARBONS (TPH) (AS NONPOLAR MATERIAL, SGT-HEM)	PA
EPA 1666 A	4-METHYL-2-PENTANONE (MIBK)	PA	EPA 1666 A	DIISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 1666 A	ETHYL ACETATE	PA	EPA 1666 A	ISOBUTYRALDEHYDE	PA
EPA 1666 A	ISOPROPYL ACETATE	PA	EPA 1666 A	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 1666 A	METHYL FORMATE	PA	EPA 1666 A	N-AMYL ACETATE	PA
EPA 1666 A	N-AMYL ALCOHOL	PA	EPA 1666 A	N-BUTYL-ACETATE	PA
EPA 1666 A	N-HEPTANE	PA	EPA 1666 A	N-HEXANE	PA
EPA 1666 A	TERT-BUTYL ALCOHOL	PA	EPA 1666 A	TETRAHYDROFURAN (THF)	PA
EPA 1666 A	XYLENE (TOTAL)	PA	EPA 1668 A	2,2',3,3',4,4',5,5',6-NONACHLOROBIPHENYL (BZ-206)	PA
EPA 1668 A	2,2',3,3',4,4',5,5'-OCTACHLOROBIPHENYL (BZ-194)	PA	EPA 1668 A	2,2',3,3',4,4',5,6'-OCTACHLOROBIPHENYL (BZ-196)	PA
EPA 1668 A	2,2',3,3',4,4',5,6,6'-NONACHLOROBIPHENYL (BZ-207)	PA	EPA 1668 A	2,2',3,3',4,4',5,6-OCTACHLOROBIPHENYL BZ-195)	PA
EPA 1668 A	2,2',3,3',4,4',5-HEPTACHLOROBIPHENYL (BZ-170)	PA	EPA 1668 A	2,2',3,3',4,4',6,6'-OCTACHLOROBIPHENYL (BZ-197)	PA
EPA 1668 A	2,2',3,3',4,4',6-HEPTACHLOROBIPHENYL (BZ-171)	PA	EPA 1668 A	2,2',3,3',4,4'-HEXACHLOROBIPHENYL (BZ-128)	PA
EPA 1668 A	2,2',3,3',4,5',6'-HEPTACHLOROBIPHENYL (BZ-177)	PA	EPA 1668 A	2,2',3,3',4,5',6,6'-OCTACHLOROBIPHENYL (BZ-201)	PA
EPA 1668 A	2,2',3,3',4,5',6-HEPTACHLOROBIPHENYL (BZ-175)	PA	EPA 1668 A	2,2',3,3',4,5'-HEXACHLOROBIPHENYL (BZ-130)	PA
EPA 1668 A	2,2',3,3',4,5,5',6'-OCTACHLOROBIPHENYL (BZ-199)	PA	EPA 1668 A	2,2',3,3',4,5,5',6,6'-NONACHLOROBIPHENYL (BZ-208)	PA
EPA 1668 A	2,2',3,3',4,5,5',6-OCTACHLOROBIPHENYL (BZ-198)	PA	EPA 1668 A	2,2',3,3',4,5,5'-HEPTACHLOROBIPHENYL (BZ-172)	PA
EPA 1668 A	2,2',3,3',4,5,6'-HEPTACHLOROBIPHENYL (BZ-174)	PA	EPA 1668 A	2,2',3,3',4,5,6,6'-OCTACHLOROBIPHENYL (BZ-200)	PA
EPA 1668 A	2,2',3,3',4,5,6-HEPTACHLOROBIPHENYL (BZ-173)	PA	EPA 1668 A	2,2',3,3',4,5-HEXACHLOROBIPHENYL (BZ-129)	PA
EPA 1668 A	2,2',3,3',4,6'-HEXACHLOROBIPHENYL (BZ-132)	PA	EPA 1668 A	2,2',3,3',4,6,6'-HEPTACHLOROBIPHENYL (BZ-176)	PA
EPA 1668 A	2,2',3,3',4,6-HEXACHLOROBIPHENYL (BZ-131)	PA	EPA 1668 A	2,2',3,3',4-PENTACHLOROBIPHENYL (BZ-82)	PA

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EPA 1668 A	2,2',3,3',5,5',6,6'-OCTACHLOROBIPHENYL (BZ-202)	PA	EPA 1668 A	2,2',3,3',5,5',6-HEPTACHLOROBIPHENYL (BZ-178)	PA
EPA 1668 A	2,2',3,3',5,5'-HEXACHLOROBIPHENYL (BZ-133)	PA	EPA 1668 A	2,2',3,3',5,6'-HEXACHLOROBIPHENYL (BZ-135)	PA
EPA 1668 A	2,2',3,3',5,6,6'-HEPTACHLOROBIPHENYL (BZ-179)	PA	EPA 1668 A	2,2',3,3',5,6-HEXACHLOROBIPHENYL (BZ-134)	PA
EPA 1668 A	2,2',3,3',5-PENTACHLOROBIPHENYL (BZ-83)	PA	EPA 1668 A	2,2',3,3',6,6'-HEXACHLOROBIPHENYL (BZ-136)	PA
EPA 1668 A	2,2',3,3',6-PENTACHLOROBIPHENYL (BZ-84)	PA	EPA 1668 A	2,2',3,3'-TETRACHLOROBIPHENYL (BZ-40)	PA
EPA 1668 A	2,2',3,4',5',6-HEXACHLOROBIPHENYL (BZ-149)	PA	EPA 1668 A	2,2',3,4',5'-PENTACHLOROBIPHENYL (BZ-97)	PA
EPA 1668 A	2,2',3,4',5,5',6-HEPTACHLOROBIPHENYL (BZ-187)	PA	EPA 1668 A	2,2',3,4',5,5'-HEXACHLOROBIPHENYL (BZ-146)	PA
EPA 1668 A	2,2',3,4',5,6'-HEXACHLOROBIPHENYL (BZ-148)	PA	EPA 1668 A	2,2',3,4',5,6,6'-HEPTACHLOROBIPHENYL (BZ-188)	PA
EPA 1668 A	2,2',3,4',5,6-HEXACHLOROBIPHENYL (BZ-147)	PA	EPA 1668 A	2,2',3,4',5-PENTACHLOROBIPHENYL (BZ-90)	PA
EPA 1668 A	2,2',3,4',6'-PENTACHLOROBIPHENYL (BZ-98)	PA	EPA 1668 A	2,2',3,4',6,6'-HEXACHLOROBIPHENYL (BZ-150)	PA
EPA 1668 A	2,2',3,4',6-PENTACHLOROBIPHENYL (BZ-91)	PA	EPA 1668 A	2,2',3,4'-TETRACHLOROBIPHENYL (BZ-42)	PA
EPA 1668 A	2,2',3,4,4',5',6-HEPTACHLOROBIPHENYL (BZ-183)	PA	EPA 1668 A	2,2',3,4,4',5'-HEXACHLOROBIPHENYL (BZ-138)	PA
EPA 1668 A	2,2',3,4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-203)	PA	EPA 1668 A	2,2',3,4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-180)	PA
EPA 1668 A	2,2',3,4,4',5,6'-HEPTACHLOROBIPHENYL (BZ-182)	PA	EPA 1668 A	2,2',3,4,4',5,6,6'-OCTACHLOROBIPHENYL (BZ-204)	PA
EPA 1668 A	2,2',3,4,4',5,6-HEPTACHLOROBIPHENYL (BZ-181)	PA	EPA 1668 A	2,2',3,4,4',5-HEXACHLOROBIPHENYL (BZ-137)	PA
EPA 1668 A	2,2',3,4,4',6'-HEXACHLOROBIPHENYL (BZ-140)	PA	EPA 1668 A	2,2',3,4,4',6,6'-HEPTACHLOROBIPHENYL (BZ-184)	PA
EPA 1668 A	2,2',3,4,4',6-HEXACHLOROBIPHENYL (BZ-139)	PA	EPA 1668 A	2,2',3,4,4'-PENTACHLOROBIPHENYL (BZ-85)	PA
EPA 1668 A	2,2',3,4,5',6-HEXACHLOROBIPHENYL (BZ-144)	PA	EPA 1668 A	2,2',3,4,5'-PENTACHLOROBIPHENYL (BZ-87)	PA
EPA 1668 A	2,2',3,4,5,5',6-HEPTACHLOROBIPHENYL (BZ-185)	PA	EPA 1668 A	2,2',3,4,5,5'-HEXACHLOROBIPHENYL (BZ-141)	PA
EPA 1668 A	2,2',3,4,5,6'-HEXACHLOROBIPHENYL (BZ-143)	PA	EPA 1668 A	2,2',3,4,5,6,6'-HEPTACHLOROBIPHENYL (BZ-186)	PA
EPA 1668 A	2,2',3,4,5,6-HEXACHLOROBIPHENYL (BZ-142)	PA	EPA 1668 A	2,2',3,4,5-PENTACHLOROBIPHENYL (BZ-86)	PA
EPA 1668 A	2,2',3,4,6'-PENTACHLOROBIPHENYL (BZ-89)	PA	EPA 1668 A	2,2',3,4,6,6'-HEXACHLOROBIPHENYL (BZ-145)	PA
EPA 1668 A	2,2',3,4,6-PENTACHLOROBIPHENYL (BZ-88)	PA	EPA 1668 A	2,2',3,4-TETRACHLOROBIPHENYL (BZ-41)	PA
EPA 1668 A	2,2',3,5',6-PENTACHLOROBIPHENYL (BZ-95)	PA	EPA 1668 A	2,2',3,5'-TETRACHLOROBIPHENYL (BZ-44)	PA
EPA 1668 A	2,2',3,5,5',6-HEXACHLOROBIPHENYL (BZ-151)	PA	EPA 1668 A	2,2',3,5,5'-PENTACHLOROBIPHENYL (BZ-92)	PA

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EPA 1668 A	2,2',3,5,6'-PENTACHLOROBIPHENYL (BZ-94)	PA	EPA 1668 A	2,2',3,5,6,6'-HEXACHLOROBIPHENYL (BZ-152)	PA
EPA 1668 A	2,2',3,5,6-PENTACHLOROBIPHENYL (BZ-93)	PA	EPA 1668 A	2,2',3,5-TETRACHLOROBIPHENYL (BZ-43)	PA
EPA 1668 A	2,2',3,6'-TETRACHLOROBIPHENYL (BZ-46)	PA	EPA 1668 A	2,2',3,6,6'-PENTACHLOROBIPHENYL (BZ-96)	PA
EPA 1668 A	2,2',3,6-TETRACHLOROBIPHENYL (BZ-45)	PA	EPA 1668 A	2,2',3-TRICHLOROBIPHENYL (BZ-16)	PA
EPA 1668 A	2,2',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-153)	PA	EPA 1668 A	2,2',4,4',5,6'-HEXACHLOROBIPHENYL (BZ-154)	PA
EPA 1668 A	2,2',4,4',5-PENTACHLOROBIPHENYL (BZ-99)	PA	EPA 1668 A	2,2',4,4',6,6'-HEXACHLOROBIPHENYL (BZ-155)	PA
EPA 1668 A	2,2',4,4',6-PENTACHLOROBIPHENYL (BZ-100)	PA	EPA 1668 A	2,2',4,4'-TETRACHLOROBIPHENYL (BZ-47)	PA
EPA 1668 A	2,2',4,5',6-PENTACHLOROBIPHENYL (BZ-103)	PA	EPA 1668 A	2,2',4,5'-TETRACHLOROBIPHENYL (BZ-49)	PA
EPA 1668 A	2,2',4,5,5'-PENTACHLOROBIPHENYL (BZ-101)	PA	EPA 1668 A	2,2',4,5,6'-PENTACHLOROBIPHENYL (BZ-102)	PA
EPA 1668 A	2,2',4,5-TETRACHLOROBIPHENYL (BZ-48)	PA	EPA 1668 A	2,2',4,6'-TETRACHLOROBIPHENYL (BZ-51)	PA
EPA 1668 A	2,2',4,6,6'-PENTACHLOROBIPHENYL (BZ-104)	PA	EPA 1668 A	2,2',4,6-TETRACHLOROBIPHENYL (BZ-50)	PA
EPA 1668 A	2,2',4-TRICHLOROBIPHENYL (BZ-17)	PA	EPA 1668 A	2,2',5,5'-TETRACHLOROBIPHENYL (BZ-52)	PA
EPA 1668 A	2,2',5,6'-TETRACHLOROBIPHENYL (BZ-53)	PA	EPA 1668 A	2,2',5-TRICHLOROBIPHENYL (BZ-18)	PA
EPA 1668 A	2,2',6,6'-TETRACHLOROBIPHENYL (BZ-54)	PA	EPA 1668 A	2,2',6-TRICHLOROBIPHENYL (BZ-19)	PA
EPA 1668 A	2,2'-DICHLOROBIPHENYL (BZ-4)	PA	EPA 1668 A	2,3',4',5',6-PENTACHLOROBIPHENYL (BZ-125)	PA
EPA 1668 A	2,3',4',5'-TETRACHLOROBIPHENYL (BZ-76)	PA	EPA 1668 A	2,3',4',5,5'-PENTACHLOROBIPHENYL (BZ-124)	PA
EPA 1668 A	2,3',4',5-TETRACHLOROBIPHENYL (BZ-70)	PA	EPA 1668 A	2,3',4',6-TETRACHLOROBIPHENYL (BZ-71)	PA
EPA 1668 A	2,3',4'-TRICHLOROBIPHENYL (BZ-33)	PA	EPA 1668 A	2,3',4,4',5',6-HEXACHLOROBIPHENYL (BZ-168)	PA
EPA 1668 A	2,3',4,4',5'-PENTACHLOROBIPHENYL (BZ-123)	PA	EPA 1668 A	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-167)	PA
EPA 1668 A	2,3',4,4',5-PENTACHLOROBIPHENYL (BZ-118)	PA	EPA 1668 A	2,3',4,4',6-PENTACHLOROBIPHENYL (BZ-119)	PA
EPA 1668 A	2,3',4,4'-TETRACHLOROBIPHENYL (BZ-66)	PA	EPA 1668 A	2,3',4,5',6-PENTACHLOROBIPHENYL (BZ-121)	PA
EPA 1668 A	2,3',4,5'-TETRACHLOROBIPHENYL (BZ-68)	PA	EPA 1668 A	2,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-120)	PA
EPA 1668 A	2,3',4,5-TETRACHLOROBIPHENYL (BZ-67)	PA	EPA 1668 A	2,3',4,6-TETRACHLOROBIPHENYL (BZ-69)	PA
EPA 1668 A	2,3',4-TRICHLOROBIPHENYL (BZ-25)	PA	EPA 1668 A	2,3',5',6-TETRACHLOROBIPHENYL (BZ-73)	PA
EPA 1668 A	2,3',5'-TRICHLOROBIPHENYL (BZ-34)	PA	EPA 1668 A	2,3',5,5'-TETRACHLOROBIPHENYL (BZ-72)	PA

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EPA 1668 A	2,3',5-TRICHLOROBIPHENYL (BZ-26)	PA
EPA 1668 A	2,3'-DICHLOROBIPHENYL (BZ-6)	PA
EPA 1668 A	2,3,3',4',5'-PENTACHLOROBIPHENYL (BZ-122)	PA
EPA 1668 A	2,3,3',4',5,5'-HEXACHLOROBIPHENYL (BZ-162)	PA
EPA 1668 A	2,3,3',4',5-PENTACHLOROBIPHENYL (BZ-107)	PA
EPA 1668 A	2,3,3',4'-TETRACHLOROBIPHENYL (BZ-56)	PA
EPA 1668 A	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (BZ-157)	PA
EPA 1668 A	2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-189)	PA
EPA 1668 A	2,3,3',4,4',5-HEXACHLOROBIPHENYL (BZ-156)	PA
EPA 1668 A	2,3,3',4,4'-PENTACHLOROBIPHENYL (BZ-105)	PA
EPA 1668 A	2,3,3',4,5'-PENTACHLOROBIPHENYL (BZ-108)	PA
EPA 1668 A	2,3,3',4,5,5'-HEXACHLOROBIPHENYL (BZ-159)	PA
EPA 1668 A	2,3,3',4,5-PENTACHLOROBIPHENYL (BZ-106)	PA
EPA 1668 A	2,3,3',4-TETRACHLOROBIPHENYL (BZ-55)	PA
EPA 1668 A	2,3,3',5'-TETRACHLOROBIPHENYL (BZ-58)	PA
EPA 1668 A	2,3,3',5,5'-PENTACHLOROBIPHENYL (BZ-111)	PA
EPA 1668 A	2,3,3',5-TETRACHLOROBIPHENYL (BZ-57)	PA
EPA 1668 A	2,3,3'-TRICHLOROBIPHENYL (BZ-20)	PA
EPA 1668 A	2,3,4',5-TETRACHLOROBIPHENYL (BZ-63)	PA
EPA 1668 A	2,3,4'-TRICHLOROBIPHENYL (BZ-22)	PA
EPA 1668 A	2,3,4,4',5-PENTACHLOROBIPHENYL (BZ-114)	PA
EPA 1668 A	2,3,4,4'-TETRACHLOROBIPHENYL (BZ-60)	PA
EPA 1668 A	2,3,4,5-TETRACHLOROBIPHENYL (BZ-61)	PA
EPA 1668 A	2,3,4-TRICHLOROBIPHENYL (BZ-21)	PA
EPA 1668 A	2,3,5-TRICHLOROBIPHENYL (BZ-23)	PA
EPA 1668 A	2,3-DICHLOROBIPHENYL (BZ-5)	PA
EPA 1668 A	2,4',6-TRICHLOROBIPHENYL (BZ-32)	PA
EPA 1668 A	2,3',6-TRICHLOROBIPHENYL (BZ-27)	PA
EPA 1668 A	2,3,3',4',5',6-HEXACHLOROBIPHENYL (BZ-164)	PA
EPA 1668 A	2,3,3',4',5,5',6-HEPTACHLOROBIPHENYL (BZ-193)	PA
EPA 1668 A	2,3,3',4',5,6-HEXACHLOROBIPHENYL (BZ-163)	PA
EPA 1668 A	2,3,3',4',6-PENTACHLOROBIPHENYL (BZ-110)	PA
EPA 1668 A	2,3,3',4,4',5',6-HEPTACHLOROBIPHENYL (BZ-191)	PA
EPA 1668 A	2,3,3',4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-205)	PA
EPA 1668 A	2,3,3',4,4',5,6-HEPTACHLOROBIPHENYL (BZ-190)	PA
EPA 1668 A	2,3,3',4,4',6-HEXACHLOROBIPHENYL (BZ-158)	PA
EPA 1668 A	2,3,3',4,5',6-HEXACHLOROBIPHENYL (BZ-161)	PA
EPA 1668 A	2,3,3',4,5,5',6-HEPTACHLOROBIPHENYL (BZ-192)	PA
EPA 1668 A	2,3,3',4,5,6-HEXACHLOROBIPHENYL (BZ-160)	PA
EPA 1668 A	2,3,3',4,6-PENTACHLOROBIPHENYL (BZ-109)	PA
EPA 1668 A	2,3,3',5',6-PENTACHLOROBIPHENYL (BZ-113)	PA
EPA 1668 A	2,3,3',5,5',6-HEXACHLOROBIPHENYL (BZ-165)	PA
EPA 1668 A	2,3,3',5,6-PENTACHLOROBIPHENYL (BZ-112)	PA
EPA 1668 A	2,3,3',6-TETRACHLOROBIPHENYL (BZ-59)	PA
EPA 1668 A	2,3,4',5,6-PENTACHLOROBIPHENYL (BZ-117)	PA
EPA 1668 A	2,3,4',6-TETRACHLOROBIPHENYL (BZ-64)	PA
EPA 1668 A	2,3,4,4',5,6-HEXACHLOROBIPHENYL (BZ-166)	PA
EPA 1668 A	2,3,4,4',6-PENTACHLOROBIPHENYL (BZ-115)	PA
EPA 1668 A	2,3,4,5,6-PENTACHLOROBIPHENYL (BZ-116)	PA
EPA 1668 A	2,3,4,6-TETRACHLOROBIPHENYL (BZ-62)	PA
EPA 1668 A	2,3,5,6-TETRACHLOROBIPHENYL (BZ-65)	PA
EPA 1668 A	2,3,6-TRICHLOROBIPHENYL (BZ-24)	PA
EPA 1668 A	2,4',5-TRICHLOROBIPHENYL (BZ-31)	PA

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EPA 1668 A	2,4'-DICHLOROBIPHENYL (BZ-8)	PA	EPA 1668 A	2,4,4',5-TETRACHLOROBIPHENYL (BZ-74)	PA
EPA 1668 A	2,4,4',6-TETRACHLOROBIPHENYL (BZ-75)	PA	EPA 1668 A	2,4,4'-TRICHLOROBIPHENYL (BZ-28)	PA
EPA 1668 A	2,4,5-TRICHLOROBIPHENYL (BZ-29)	PA	EPA 1668 A	2,4,6-TRICHLOROBIPHENYL (BZ-30)	PA
EPA 1668 A	2,4-DICHLOROBIPHENYL (BZ-7)	PA	EPA 1668 A	2,5-DICHLOROBIPHENYL (BZ-9)	PA
EPA 1668 A	2,6-DICHLOROBIPHENYL (BZ-10)	PA	EPA 1668 A	2-CHLOROBIPHENYL (BZ-1)	PA
EPA 1668 A	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-169)	PA	EPA 1668 A	3,3',4,4',5-PENTACHLOROBIPHENYL (BZ-126)	PA
EPA 1668 A	3,3',4,4'-TETRACHLOROBIPHENYL (BZ-77)	PA	EPA 1668 A	3,3',4,5'-TETRACHLOROBIPHENYL (BZ-79)	PA
EPA 1668 A	3,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-127)	PA	EPA 1668 A	3,3',4,5-TETRACHLOROBIPHENYL (BZ-78)	PA
EPA 1668 A	3,3',4-TRICHLOROBIPHENYL (BZ-35)	PA	EPA 1668 A	3,3',5,5'-TETRACHLOROBIPHENYL (BZ-80)	PA
EPA 1668 A	3,3',5-TRICHLOROBIPHENYL (BZ-36)	PA	EPA 1668 A	3,3'-DICHLOROBIPHENYL (BZ-11)	PA
EPA 1668 A	3,4',5-TRICHLOROBIPHENYL (BZ-39)	PA	EPA 1668 A	3,4'-DICHLOROBIPHENYL (BZ-13)	PA
EPA 1668 A	3,4,4',5-TETRACHLOROBIPHENYL (BZ-81)	PA	EPA 1668 A	3,4,4'-TRICHLOROBIPHENYL (BZ-37)	PA
EPA 1668 A	3,4,5-TRICHLOROBIPHENYL (BZ-38)	PA	EPA 1668 A	3,4-DICHLOROBIPHENYL (BZ-12)	PA
EPA 1668 A	3,5-DICHLOROBIPHENYL (BZ-14)	PA	EPA 1668 A	3-CHLOROBIPHENYL (BZ-2)	PA
EPA 1668 A	4,4'-DICHLOROBIPHENYL (BZ-15)	PA	EPA 1668 A	4-CHLOROBIPHENYL (BZ-3)	PA
EPA 1668 A	DECACHLOROBIPHENYL (BZ-209)	PA	EPA 1671 A	2-METHOXYETHANOL (METHYL CELLOSOLVE)	PA
EPA 1671 A	ACETONITRILE	PA	EPA 1671 A	DIETHYLAMINE	PA
EPA 1671 A	DIMETHYL SULFOXIDE	PA	EPA 1671 A	ETHANOL	PA
EPA 1671 A	METHANOL	PA	EPA 1671 A	N-PROPANOL (1-PROPANOL)	PA
EPA 1671 A	TRIETHYLAMINE	PA	EPA 180.1 REV 2	TURBIDITY	PA
EPA 200.2 REV 2.8	PREP: SAMPLE PREPARATION PROCEDURE FOR SPECTROCHEMICAL DETERMINATION OF TOTAL RECOVERABLE ELEMENTS	PA	EPA 200.7 REV 4.4	ALUMINUM	PA
EPA 200.7 REV 4.4	ANTIMONY	PA	EPA 200.7 REV 4.4	ARSENIC	PA
EPA 200.7 REV 4.4	BARIUM	PA	EPA 200.7 REV 4.4	BERYLLIUM	PA
EPA 200.7 REV 4.4	BORON	PA	EPA 200.7 REV 4.4	CADMIUM	PA
EPA 200.7 REV 4.4	CALCIUM	PA	EPA 200.7 REV 4.4	CHROMIUM	PA
EPA 200.7 REV 4.4	COBALT	PA	EPA 200.7 REV 4.4	COPPER	PA
EPA 200.7 REV 4.4	IRON	PA	EPA 200.7 REV 4.4	LEAD	PA
EPA 200.7 REV 4.4	MAGNESIUM	PA	EPA 200.7 REV 4.4	MANGANESE	PA
EPA 200.7 REV 4.4	MOLYBDENUM	PA	EPA 200.7 REV 4.4	NICKEL	PA
EPA 200.7 REV 4.4	POTASSIUM	PA	EPA 200.7 REV 4.4	SELENIUM	PA
EPA 200.7 REV 4.4	SILVER	PA	EPA 200.7 REV 4.4	SODIUM	PA
EPA 200.7 REV 4.4	THALLIUM	PA	EPA 200.7 REV 4.4	TIN	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 200.7 REV 4.4	TITANIUM	PA	EPA 200.7 REV 4.4	VANADIUM	PA
EPA 200.7 REV 4.4	ZINC	PA	EPA 200.8 REV 5.4	ALUMINUM	PA
EPA 200.8 REV 5.4	ANTIMONY	PA	EPA 200.8 REV 5.4	ARSENIC	PA
EPA 200.8 REV 5.4	BARIUM	PA	EPA 200.8 REV 5.4	BERYLLIUM	PA
EPA 200.8 REV 5.4	CADMIUM	PA	EPA 200.8 REV 5.4	CHROMIUM	PA
EPA 200.8 REV 5.4	COBALT	PA	EPA 200.8 REV 5.4	COPPER	PA
EPA 200.8 REV 5.4	LEAD	PA	EPA 200.8 REV 5.4	MANGANESE	PA
EPA 200.8 REV 5.4	MOLYBDENUM	PA	EPA 200.8 REV 5.4	NICKEL	PA
EPA 200.8 REV 5.4	SELENIUM	PA	EPA 200.8 REV 5.4	SILVER	PA
EPA 200.8 REV 5.4	THALLIUM	PA	EPA 200.8 REV 5.4	VANADIUM	PA
EPA 200.8 REV 5.4	ZINC	PA	EPA 200.8 REV 5.4 - EXTENDED	BORON	PA
EPA 200.8 REV 5.4 - EXTENDED	CALCIUM	PA	EPA 200.8 REV 5.4 - EXTENDED	IRON	PA
EPA 200.8 REV 5.4 - EXTENDED	MAGNESIUM	PA	EPA 200.8 REV 5.4 - EXTENDED	POTASSIUM	PA
EPA 200.8 REV 5.4 - EXTENDED	SODIUM	PA	EPA 200.8 REV 5.4 - EXTENDED	TIN	PA
EPA 200.8 REV 5.4 - EXTENDED	TITANIUM	PA	EPA 245.1 REV 3	MERCURY	PA
EPA 300.0 REV 2.1	BROMIDE	PA	EPA 300.0 REV 2.1	CHLORIDE	PA
EPA 300.0 REV 2.1	FLUORIDE	PA	EPA 300.0 REV 2.1	NITRATE AS N	PA
EPA 300.0 REV 2.1	NITRITE AS N	PA	EPA 300.0 REV 2.1	SULFATE	PA
EPA 3005 A	PREP: ACID DIGESTION OF WATERS FOR TOTAL RECOVERABLE OR DISSOLVED METALS	PA	EPA 3010 A	PREP: ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	PA
EPA 3020 A	PREP: ACID DIGESTION OF AQUEOUS SAMPLES AND EXTRACTS FOR TOTAL METALS	PA	EPA 335.4 REV 1.0	CYANIDE	PA
EPA 351.2 REV 2	KJELDAHL NITROGEN - TOTAL	PA	EPA 3510 C	PREP: LIQUID-LIQUID EXTRACTION	PA
EPA 3511	PREP: ORGANIC EXTRACTION AND SAMPLE PREPARATION	PA	EPA 3520 C	PREP: CONTINUOUS LIQUID-LIQUID EXTRACTION	PA
EPA 353.2 REV 2	NITRATE AS N	PA	EPA 353.2 REV 2	NITRATE/NITRITE	PA
EPA 353.2 REV 2	NITRITE AS N	PA	EPA 3620 B	PREP: FLORISIL CLEANUP	PA
EPA 3630 C	PREP: SILICA GEL CLEANUP	PA	EPA 365.1 REV 2	PHOSPHORUS, TOTAL	PA
EPA 365.3	ORTHOPHOSPHATE AS P	PA	EPA 410.4 REV 2	CHEMICAL OXYGEN DEMAND	PA
EPA 420.4 REV 1	TOTAL PHENOLICS	PA	EPA 5030	PREP: PURGE AND TRAP FOR AQUEOUS SAMPLES	PA
EPA 6010 B	ALUMINUM	PA	EPA 6010 B	ANTIMONY	PA
EPA 6010 B	ARSENIC	PA	EPA 6010 B	BARIUM	PA
EPA 6010 B	BERYLLIUM	PA	EPA 6010 B	BORON	PA
EPA 6010 B	CADMIUM	PA	EPA 6010 B	CALCIUM	PA
EPA 6010 B	CHROMIUM	PA	EPA 6010 B	COBALT	PA

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EPA 6010 B	COPPER	PA	EPA 6010 B	IRON	PA
EPA 6010 B	LEAD	PA	EPA 6010 B	LITHIUM	PA
EPA 6010 B	MAGNESIUM	PA	EPA 6010 B	MANGANESE	PA
EPA 6010 B	MOLYBDENUM	PA	EPA 6010 B	NICKEL	PA
EPA 6010 B	POTASSIUM	PA	EPA 6010 B	SELENIUM	PA
EPA 6010 B	SILVER	PA	EPA 6010 B	SODIUM	PA
EPA 6010 B	STRONTIUM	PA	EPA 6010 B	THALLIUM	PA
EPA 6010 B	TIN	PA	EPA 6010 B	TITANIUM	PA
EPA 6010 B	VANADIUM	PA	EPA 6010 B	ZINC	PA
EPA 6010 C	ALUMINUM	PA	EPA 6010 C	ANTIMONY	PA
EPA 6010 C	ARSENIC	PA	EPA 6010 C	BARIUM	PA
EPA 6010 C	BERYLLIUM	PA	EPA 6010 C	BORON	PA
EPA 6010 C	CADMIUM	PA	EPA 6010 C	CALCIUM	PA
EPA 6010 C	CHROMIUM	PA	EPA 6010 C	COBALT	PA
EPA 6010 C	COPPER	PA	EPA 6010 C	IRON	PA
EPA 6010 C	LEAD	PA	EPA 6010 C	LITHIUM	PA
EPA 6010 C	MAGNESIUM	PA	EPA 6010 C	MANGANESE	PA
EPA 6010 C	MOLYBDENUM	PA	EPA 6010 C	NICKEL	PA
EPA 6010 C	POTASSIUM	PA	EPA 6010 C	SELENIUM	PA
EPA 6010 C	SILVER	PA	EPA 6010 C	SODIUM	PA
EPA 6010 C	STRONTIUM	PA	EPA 6010 C	THALLIUM	PA
EPA 6010 C	TIN	PA	EPA 6010 C	TITANIUM	PA
EPA 6010 C	VANADIUM	PA	EPA 6010 C	ZINC	PA
EPA 602	BENZENE	PA	EPA 602	ETHYLBENZENE	PA
EPA 602	TOLUENE	PA	EPA 602	XYLENE (TOTAL)	PA
EPA 6020 A	ALUMINUM	PA	EPA 6020 A	ANTIMONY	PA
EPA 6020 A	ARSENIC	PA	EPA 6020 A	BARIUM	PA
EPA 6020 A	BERYLLIUM	PA	EPA 6020 A	CADMIUM	PA
EPA 6020 A	CALCIUM	PA	EPA 6020 A	CHROMIUM	PA
EPA 6020 A	COBALT	PA	EPA 6020 A	COPPER	PA
EPA 6020 A	IRON	PA	EPA 6020 A	LEAD	PA
EPA 6020 A	MAGNESIUM	PA	EPA 6020 A	MANGANESE	PA
EPA 6020 A	NICKEL	PA	EPA 6020 A	POTASSIUM	PA
EPA 6020 A	SELENIUM	PA	EPA 6020 A	SILVER	PA
EPA 6020 A	SODIUM	PA	EPA 6020 A	THALLIUM	PA
EPA 6020 A	VANADIUM	PA	EPA 6020 A	ZINC	PA
EPA 6020 A - EXTENDED	BORON	PA	EPA 6020 A - EXTENDED	MOLYBDENUM	PA
EPA 6020 A - EXTENDED	STRONTIUM	PA	EPA 6020 A - EXTENDED	TIN	PA
EPA 6020 A - EXTENDED	TITANIUM	PA	EPA 608	4,4'-DDD	PA

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EPA 608	4,4'-DDE	PA	EPA 608	4,4'-DDT	PA
EPA 608	ALDRIN	PA	EPA 608	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 608	AROCLOR-1016 (PCB-1016)	PA	EPA 608	AROCLOR-1221 (PCB-1221)	PA
EPA 608	AROCLOR-1232 (PCB-1232)	PA	EPA 608	AROCLOR-1242 (PCB-1242)	PA
EPA 608	AROCLOR-1248 (PCB-1248)	PA	EPA 608	AROCLOR-1254 (PCB-1254)	PA
EPA 608	AROCLOR-1260 (PCB-1260)	PA	EPA 608	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA
EPA 608	CHLORDANE (TECH.)	PA	EPA 608	DELTA-BHC	PA
EPA 608	DIELDRIN	PA	EPA 608	ENDOSULFAN I	PA
EPA 608	ENDOSULFAN II	PA	EPA 608	ENDOSULFAN SULFATE	PA
EPA 608	ENDRIN	PA	EPA 608	ENDRIN ALDEHYDE	PA
EPA 608	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 608	HEPTACHLOR	PA
EPA 608	HEPTACHLOR EPOXIDE	PA	EPA 608	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 622	AZINPHOS-METHYL (GUTHION)	PA	EPA 622	BOLSTAR (SULPROFOS)	PA
EPA 622	CHLORPYRIFOS	PA	EPA 622	DEMETON-O	PA
EPA 622	DEMETON-S	PA	EPA 622	DIAZINON	PA
EPA 622	DICHLOROVOS (DDVP, DICHLORVOS)	PA	EPA 622	DISULFOTON	PA
EPA 622	ETHOPROP	PA	EPA 622	FENSULFOTHION	PA
EPA 622	FENTHION	PA	EPA 622	MERPHOS	PA
EPA 622	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 622	MEVINPHOS	PA
EPA 622	NALED	PA	EPA 622	PHORATE	PA
EPA 622	STIROFOS	PA	EPA 624	1,1,1-TRICHLOROETHANE	PA
EPA 624	1,1,2,2-TETRACHLOROETHANE	PA	EPA 624	1,1,2-TRICHLOROETHANE	PA
EPA 624	1,1-DICHLOROETHANE	PA	EPA 624	1,2-DICHLOROBENZENE	PA
EPA 624	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA	EPA 624	1,2-DICHLOROPROPANE	PA
EPA 624	1,3-DICHLOROBENZENE	PA	EPA 624	1,4-DICHLOROBENZENE	PA
EPA 624	2-CHLOROETHYL VINYL ETHER	PA	EPA 624	ACROLEIN (PROPENAL)	PA
EPA 624	ACRYLONITRILE	PA	EPA 624	BENZENE	PA
EPA 624	BROMODICHLOROMETHANE	PA	EPA 624	BROMOFORM	PA
EPA 624	CARBON TETRACHLORIDE	PA	EPA 624	CHLOROBENZENE	PA
EPA 624	CHLORODIBROMOMETHANE	PA	EPA 624	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 624	CHLOROFORM	PA	EPA 624	CIS-1,3-DICHLOROPROPENE	PA
EPA 624	ETHYLBENZENE	PA	EPA 624	METHYL BROMIDE (BROMOMETHANE)	PA

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EPA 624	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 624	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 624	TETRACHLOROETHENE (PERCHLOROETHENE)	PA	EPA 624	TOLUENE	PA
EPA 624	TRANS-1,2-DICHLOROETHENE	PA	EPA 624	TRANS-1,3-DICHLOROPROPENE	PA
EPA 624	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 624	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 624	VINYL CHLORIDE	PA	EPA 624 - EXTENDED	1,1-DICHLOROETHYLENE	PA
EPA 625	1,2,4-TRICHLOROBENZENE	PA	EPA 625	2,4,6-TRICHLOROPHENOL	PA
EPA 625	2,4-DICHLOROPHENOL	PA	EPA 625	2,4-DIMETHYLPHENOL	PA
EPA 625	2,4-DINITROPHENOL	PA	EPA 625	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 625	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 625	2-CHLORONAPHTHALENE	PA
EPA 625	2-CHLOROPHENOL	PA	EPA 625	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 625	2-METHYLPHENOL (O-CRESOL)	PA	EPA 625	2-NITROPHENOL	PA
EPA 625	3,3'-DICHLOROBENZIDINE	PA	EPA 625	4-BROMOPHENYL PHENYL ETHER	PA
EPA 625	4-CHLORO-3-METHYLPHENOL	PA	EPA 625	4-CHLOROPHENYL PHENYLETHER	PA
EPA 625	4-NITROPHENOL	PA	EPA 625	ACENAPHTHENE	PA
EPA 625	ACENAPHTHYLENE	PA	EPA 625	ANTHRACENE	PA
EPA 625	BENZIDINE	PA	EPA 625	BENZO(A)ANTHRACENE	PA
EPA 625	BENZO(A)PYRENE	PA	EPA 625	BENZO(B)FLUORANTHENE	PA
EPA 625	BENZO(G,H,I)PERYLENE	PA	EPA 625	BENZO(K)FLUORANTHENE	PA
EPA 625	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 625	BIS(2-CHLOROETHYL) ETHER	PA
EPA 625	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 625	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 625	BUTYL BENZYL PHTHALATE	PA	EPA 625	CHRYSENE	PA
EPA 625	DI-N-BUTYL PHTHALATE	PA	EPA 625	DI-N-OCTYL PHTHALATE	PA
EPA 625	DIBENZO(A,H) ANTHRACENE	PA	EPA 625	DIETHYL PHTHALATE	PA
EPA 625	DIMETHYL PHTHALATE	PA	EPA 625	FLUORANTHENE	PA
EPA 625	FLUORENE	PA	EPA 625	HEXACHLOROBENZENE	PA
EPA 625	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 625	HEXACHLOROCYCLOPENTADIENE	PA
EPA 625	HEXACHLOROETHANE	PA	EPA 625	INDENO(1,2,3-CD) PYRENE	PA
EPA 625	ISOPHORONE	PA	EPA 625	N-NITROSODI-N-PROPYLAMINE	PA
EPA 625	N-NITROSODIMETHYLAMINE	PA	EPA 625	N-NITROSODIPHENYLAMINE	PA
EPA 625	NAPHTHALENE	PA	EPA 625	NITROBENZENE	PA
EPA 625	PENTACHLOROPHENOL	PA	EPA 625	PHENANTHRENE	PA
EPA 625	PHENOL	PA	EPA 625	PYRENE	PA
EPA 625 - EXTENDED	1,2-DIPHENYLHYDRAZINE	PA	EPA 625 - EXTENDED	4-METHYLPHENOL (P-CRESOL)	PA
EPA 625 - EXTENDED	ACETOPHENONE	PA	EPA 625 - EXTENDED	ANILINE	PA

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Scope of Accreditation

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Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 625 - EXTENDED	CARBAZOLE	PA	EPA 625 - EXTENDED	N-DECANE	PA
EPA 625 - EXTENDED	N-OCTADECANE	PA	EPA 625 - EXTENDED	PYRIDINE	PA
EPA 6850	PERCHLORATE	PA	EPA 7196 A	CHROMIUM VI	PA
EPA 7470 A	MERCURY	PA	EPA 8011	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 8011	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA	EPA 8015 B	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 B	ETHANOL	PA	EPA 8015 B	ETHYLENE GLYCOL	PA
EPA 8015 B	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 B	METHANOL	PA	EPA 8015 C	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 C	ETHANOL	PA	EPA 8015 C	ETHYLENE GLYCOL	PA
EPA 8015 C	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 C	METHANOL	PA	EPA 8021 B	BENZENE	PA
EPA 8021 B	ETHYLBENZENE	PA	EPA 8021 B	ISOPROPYLBENZENE	PA
EPA 8021 B	M+P-XYLENE	PA	EPA 8021 B	NAPHTHALENE	PA
EPA 8021 B	O-XYLENE	PA	EPA 8021 B	TOLUENE	PA
EPA 8021 B	XYLENE (TOTAL)	PA	EPA 8021 B - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	PA
EPA 8081 A	4,4'-DDD	PA	EPA 8081 A	4,4'-DDE	PA
EPA 8081 A	4,4'-DDT	PA	EPA 8081 A	ALDRIN	PA
EPA 8081 A	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA
EPA 8081 A	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	CHLORDANE (TECH.)	PA
EPA 8081 A	DELTA-BHC	PA	EPA 8081 A	DIELDRIN	PA
EPA 8081 A	ENDOSULFAN I	PA	EPA 8081 A	ENDOSULFAN II	PA
EPA 8081 A	ENDOSULFAN SULFATE	PA	EPA 8081 A	ENDRIN	PA
EPA 8081 A	ENDRIN ALDEHYDE	PA	EPA 8081 A	ENDRIN KETONE	PA
EPA 8081 A	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA
EPA 8081 A	HEPTACHLOR	PA	EPA 8081 A	HEPTACHLOR EPOXIDE	PA
EPA 8081 A	METHOXYCHLOR	PA	EPA 8081 A	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 8081 A - EXTENDED	KEPONE	PA	EPA 8081 B	4,4'-DDD	PA
EPA 8081 B	4,4'-DDE	PA	EPA 8081 B	4,4'-DDT	PA
EPA 8081 B	ALDRIN	PA	EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA
EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA	EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA

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			EPA 8081 B	CHLORDANE (TECH.)	PA
EPA 8081 B	DELTA-BHC	PA	EPA 8081 B	DIELDRIN	PA
EPA 8081 B	ENDOSULFAN I	PA	EPA 8081 B	ENDOSULFAN II	PA
EPA 8081 B	ENDOSULFAN SULFATE	PA	EPA 8081 B	ENDRIN	PA
EPA 8081 B	ENDRIN ALDEHYDE	PA	EPA 8081 B	ENDRIN KETONE	PA
EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA
EPA 8081 B	HEPTACHLOR	PA	EPA 8081 B	HEPTACHLOR EPOXIDE	PA
EPA 8081 B	METHOXYCHLOR	PA	EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 8081 B - EXTENDED	KEPONE	PA	EPA 8082 A	AROCLOR-1016 (PCB-1016)	PA
EPA 8082 A	AROCLOR-1221 (PCB-1221)	PA	EPA 8082 A	AROCLOR-1232 (PCB-1232)	PA
EPA 8082 A	AROCLOR-1242 (PCB-1242)	PA	EPA 8082 A	AROCLOR-1248 (PCB-1248)	PA
EPA 8082 A	AROCLOR-1254 (PCB-1254)	PA	EPA 8082 A	AROCLOR-1260 (PCB-1260)	PA
EPA 8082 A - EXTENDED	AROCLOR-1262 (PCB-1262)	PA	EPA 8082 A - EXTENDED	AROCLOR-1268 (PCB-1268)	PA
EPA 8141 A	ATRAZINE	PA	EPA 8141 A	BOLSTAR (SULPROFOS)	PA
EPA 8141 A	CHLORPYRIFOS	PA	EPA 8141 A	COUMAPHOS	PA
EPA 8141 A	DEMETON-O	PA	EPA 8141 A	DEMETON-S	PA
EPA 8141 A	DIAZINON	PA	EPA 8141 A	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 A	DISULFOTON	PA	EPA 8141 A	ETHION	PA
EPA 8141 A	ETHOPROP	PA	EPA 8141 A	FAMPHUR	PA
EPA 8141 A	FENSULFOTHION	PA	EPA 8141 A	FENTHION	PA
EPA 8141 A	MALATHION	PA	EPA 8141 A	MERPHOS	PA
EPA 8141 A	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8141 A	MEVINPHOS	PA
EPA 8141 A	NALED	PA	EPA 8141 A	PARATHION (PARATHION - ETHYL)	PA
EPA 8141 A	PHORATE	PA	EPA 8141 A	RONNEL	PA
EPA 8141 A	SIMAZINE	PA	EPA 8141 A	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA
EPA 8141 A	TOKUTHION (PROTHIOPHOS)	PA	EPA 8141 A	TRICHLORONATE	PA
EPA 8141 B	ATRAZINE	PA	EPA 8141 B	AZINPHOS-METHYL (GUTHION)	PA
EPA 8141 B	BOLSTAR (SULPROFOS)	PA	EPA 8141 B	CHLORPYRIFOS	PA
EPA 8141 B	COUMAPHOS	PA	EPA 8141 B	DEMETON-O	PA
EPA 8141 B	DEMETON-S	PA	EPA 8141 B	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 B	DISULFOTON	PA	EPA 8141 B	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA
EPA 8141 B	ETHION	PA	EPA 8141 B	ETHOPROP	PA
EPA 8141 B	FAMPHUR	PA	EPA 8141 B	FENSULFOTHION	PA
EPA 8141 B	FENTHION	PA	EPA 8141 B	MALATHION	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8141 B	MERPHOS	PA	EPA 8141 B	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8141 B	MEVINPHOS	PA	EPA 8141 B	NALED	PA
EPA 8141 B	PARATHION (PARATHION - ETHYL)	PA	EPA 8141 B	PHORATE	PA
EPA 8141 B	RONNEL	PA	EPA 8141 B	SIMAZINE	PA
EPA 8141 B	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA	EPA 8141 B	TOKUTHION (PROTHIOPHOS)	PA
EPA 8141 B	TRICHLORONATE	PA	EPA 8151 A	2,4,5-T	PA
EPA 8151 A	2,4-D	PA	EPA 8151 A	2,4-DB	PA
EPA 8151 A	DALAPON	PA	EPA 8151 A	DICAMBA	PA
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	PA	EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA
EPA 8151 A	MCPA	PA	EPA 8151 A	MCPP	PA
EPA 8151 A	PENTACHLOROPHENOL	PA	EPA 8151 A	PICLORAM	PA
EPA 8151 A	SILVEX (2,4,5-TP)	PA	EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	PA
EPA 8260 B	1,1,1-TRICHLOROETHANE	PA	EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 B	1,1,2-TRICHLOROETHANE	PA	EPA 8260 B	1,1-DICHLOROETHANE	PA
EPA 8260 B	1,1-DICHLOROETHYLENE	PA	EPA 8260 B	1,1-DICHLOROPROPENE	PA
EPA 8260 B	1,2,3-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 B	1,2,4-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,4-TRIMETHYLBENZENE	PA
EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA	EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 B	1,2-DICHLOROBENZENE	PA	EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 B	1,2-DICHLOROPROPANE	PA	EPA 8260 B	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 B	1,3-DICHLOROBENZENE	PA	EPA 8260 B	1,3-DICHLOROPROPANE	PA
EPA 8260 B	1,4-DICHLOROBENZENE	PA	EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 B	1-BUTANOL (N-BUTANOL)	PA	EPA 8260 B	2,2-DICHLOROPROPANE	PA
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 B	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 B	2-CHLOROTOLUENE	PA	EPA 8260 B	2-HEXANONE	PA
EPA 8260 B	2-NITROPROPANE	PA	EPA 8260 B	4-CHLOROTOLUENE	PA
EPA 8260 B	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 B	ACETONE	PA	EPA 8260 B	ACETONITRILE	PA
EPA 8260 B	ACROLEIN (PROPENAL)	PA	EPA 8260 B	ACRYLONITRILE	PA
EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 B	BENZENE	PA
EPA 8260 B	BENZYL CHLORIDE	PA	EPA 8260 B	BROMOBENZENE	PA
EPA 8260 B	BROMOCHLOROMETHANE	PA	EPA 8260 B	BROMODICHLOROMETHANE	PA
EPA 8260 B	BROMOFORM	PA	EPA 8260 B	CARBON DISULFIDE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 B	CARBON TETRACHLORIDE	PA	EPA 8260 B	CHLOROBENZENE	PA
EPA 8260 B	CHLORODIBROMOMETHANE	PA	EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 B	CHLOROFORM	PA	EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 B	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	PA	EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	PA
EPA 8260 B	DIETHYL ETHER	PA	EPA 8260 B	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA
EPA 8260 B	ETHANOL	PA	EPA 8260 B	ETHYL ACETATE	PA
EPA 8260 B	ETHYL METHACRYLATE	PA	EPA 8260 B	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B	ETHYLBENZENE	PA	EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8260 B	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 B	ISOPROPYLBENZENE	PA
EPA 8260 B	M+P-XYLENE	PA	EPA 8260 B	METHACRYLONITRILE	PA
EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	PA	EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	PA
EPA 8260 B	METHYL METHACRYLATE	PA	EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	PA
EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 B	N-BUTYLBENZENE	PA
EPA 8260 B	N-PROPYLAMINE	PA	EPA 8260 B	N-PROPYLBENZENE	PA
EPA 8260 B	NAPHTHALENE	PA	EPA 8260 B	O-XYLENE	PA
EPA 8260 B	PENTACHLOROETHANE	PA	EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 B	SEC-BUTYLBENZENE	PA	EPA 8260 B	STYRENE	PA
EPA 8260 B	TERT-BUTYL ALCOHOL	PA	EPA 8260 B	TERT-BUTYLBENZENE	PA
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	PA	EPA 8260 B	TOLUENE	PA
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	PA	EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	PA
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	PA	EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA	EPA 8260 B	VINYL ACETATE	PA
EPA 8260 B	VINYL CHLORIDE	PA	EPA 8260 B	XYLENE (TOTAL)	PA
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	PA	EPA 8260 B - EXTENDED	CYCLOHEXANE	PA
EPA 8260 B - EXTENDED	DIISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA	EPA 8260 B - EXTENDED	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8260 B - EXTENDED	METHYL ACETATE	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 B - EXTENDED	METHYLCYCLOHEXANE	PA	EPA 8260 B - EXTENDED	N-HEXANE	PA
EPA 8260 B - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 B - EXTENDED	T-AMYLMETHYLETHER (TAME)	PA
EPA 8260 B - EXTENDED	TETRAHYDROFURAN (THF)	PA	EPA 8260 C	1,1,1,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1,1-TRICHLOROETHANE	PA	EPA 8260 C	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1,2-TRICHLOROETHANE	PA	EPA 8260 C	1,1-DICHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROETHYLENE	PA	EPA 8260 C	1,1-DICHLOROPROPENE	PA
EPA 8260 C	1,2,3-TRICHLOROBENZENE	PA	EPA 8260 C	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 C	1,2,4-TRICHLOROBENZENE	PA	EPA 8260 C	1,2,4-TRIMETHYLBENZENE	PA
EPA 8260 C	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA	EPA 8260 C	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 C	1,2-DICHLOROBENZENE	PA	EPA 8260 C	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 C	1,2-DICHLOROPROPANE	PA	EPA 8260 C	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 C	1,3-DICHLOROBENZENE	PA	EPA 8260 C	1,3-DICHLOROPROPANE	PA
EPA 8260 C	1,4-DICHLOROBENZENE	PA	EPA 8260 C	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 C	1-BUTANOL (N-BUTANOL)	PA	EPA 8260 C	2,2-DICHLOROPROPANE	PA
EPA 8260 C	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 C	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 C	2-CHLOROTOLUENE	PA	EPA 8260 C	2-HEXANONE	PA
EPA 8260 C	2-NITROPROPANE	PA	EPA 8260 C	4-CHLOROTOLUENE	PA
EPA 8260 C	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 C	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 C	ACETONE	PA	EPA 8260 C	ACETONITRILE	PA
EPA 8260 C	ACROLEIN (PROPENAL)	PA	EPA 8260 C	ACRYLONITRILE	PA
EPA 8260 C	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 C	BENZENE	PA
EPA 8260 C	BENZYL CHLORIDE	PA	EPA 8260 C	BROMOBENZENE	PA
EPA 8260 C	BROMOCHLOROMETHANE	PA	EPA 8260 C	BROMODICHLOROMETHANE	PA
EPA 8260 C	BROMOFORM	PA	EPA 8260 C	CARBON DISULFIDE	PA
EPA 8260 C	CARBON TETRACHLORIDE	PA	EPA 8260 C	CHLOROBENZENE	PA
EPA 8260 C	CHLORODIBROMOMETHANE	PA	EPA 8260 C	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 C	CHLOROFORM	PA	EPA 8260 C	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 C	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 C	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 C	CYCLOHEXANE	PA	EPA 8260 C	DIBROMOMETHANE (METHYLENE BROMIDE)	PA
EPA 8260 C	DICHLORODIFLUOROMETHANE (FREON-12)	PA	EPA 8260 C	DIETHYL ETHER	PA
EPA 8260 C	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA	EPA 8260 C	ETHANOL	PA
EPA 8260 C	ETHYL ACETATE	PA	EPA 8260 C	ETHYL METHACRYLATE	PA

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NON-POTABLE WATER

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EPA 8260 C	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA	EPA 8260 C	ETHYLBENZENE	PA
EPA 8260 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8260 C	HEXACHLOROETHANE	PA
EPA 8260 C	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 C	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 C	ISOPROPYLBENZENE	PA
EPA 8260 C	METHACRYLONITRILE	PA	EPA 8260 C	METHYL BROMIDE (BROMOMETHANE)	PA
EPA 8260 C	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 8260 C	METHYL METHACRYLATE	PA
EPA 8260 C	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8260 C	METHYLCYCLOHEXANE	PA
EPA 8260 C	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 C	N-BUTYLBENZENE	PA
EPA 8260 C	N-PROPYLBENZENE	PA	EPA 8260 C	NAPHTHALENE	PA
EPA 8260 C	PENTACHLOROETHANE	PA	EPA 8260 C	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 C	SEC-BUTYLBENZENE	PA	EPA 8260 C	STYRENE	PA
EPA 8260 C	T-AMYLMETHYLETHER (TAME)	PA	EPA 8260 C	TERT-BUTYL ALCOHOL	PA
EPA 8260 C	TERT-BUTYLBENZENE	PA	EPA 8260 C	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 8260 C	TOLUENE	PA	EPA 8260 C	TRANS-1,2-DICHLOROETHENE	PA
EPA 8260 C	TRANS-1,3-DICHLOROPROPENE	PA	EPA 8260 C	TRANS-1,4-DICHLORO-2-BUTENE	PA
EPA 8260 C	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA	EPA 8260 C	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 8260 C	VINYL ACETATE	PA	EPA 8260 C	VINYL CHLORIDE	PA
EPA 8260 C	XYLENE (TOTAL)	PA	EPA 8260 C - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	PA
EPA 8260 C - EXTENDED	CYCLOHEXANONE	PA	EPA 8260 C - EXTENDED	DIISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 8260 C - EXTENDED	DIMETHYL ETHER	PA	EPA 8260 C - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA
EPA 8260 C - EXTENDED	METHYL ACETATE	PA	EPA 8260 C - EXTENDED	N-HEPTANE	PA
EPA 8260 C - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 C - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8270 C	1,2,4,5-TETRACHLOROBENZENE	PA	EPA 8270 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8270 C	1,2-DICHLOROBENZENE	PA	EPA 8270 C	1,2-DIPHENYLHYDRAZINE	PA
EPA 8270 C	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8270 C	1,3-DICHLOROBENZENE	PA
EPA 8270 C	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8270 C	1,4-DICHLOROBENZENE	PA
EPA 8270 C	1,4-DINITROBENZENE	PA	EPA 8270 C	1,4-NAPHTHOQUINONE	PA
EPA 8270 C	1,4-PHENYLENEDIAMINE	PA	EPA 8270 C	1-CHLORONAPHTHALENE	PA
EPA 8270 C	1-NAPHTHYLAMINE	PA	EPA 8270 C	2,3,4,6-TETRACHLOROPHENOL	PA
EPA 8270 C	2,4,5-TRICHLOROPHENOL	PA	EPA 8270 C	2,4,6-TRICHLOROPHENOL	PA

Scope of Accreditation

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Eurofins Lancaster Laboratories Environmental, LLC
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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	2,4-DICHLOROPHENOL	PA	EPA 8270 C	2,4-DIMETHYLPHENOL	PA
EPA 8270 C	2,4-DINITROPHENOL	PA	EPA 8270 C	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8270 C	2,6-DICHLOROPHENOL	PA	EPA 8270 C	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8270 C	2-ACETYLAMINOFLUORENE	PA	EPA 8270 C	2-CHLORONAPHTHALENE	PA
EPA 8270 C	2-CHLOROPHENOL	PA	EPA 8270 C	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 8270 C	2-METHYLNAPHTHALENE	PA	EPA 8270 C	2-METHYLPHENOL (O-CRESOL)	PA
EPA 8270 C	2-NAPHTHYLAMINE	PA	EPA 8270 C	2-NITROANILINE	PA
EPA 8270 C	2-NITROPHENOL	PA	EPA 8270 C	2-PICOLINE (2-METHYLPYRIDINE)	PA
EPA 8270 C	3,3'-DICHLOROBENZIDINE	PA	EPA 8270 C	3,3'-DIMETHYLBENZIDINE	PA
EPA 8270 C	3-METHYLCHOLANTHRENE	PA	EPA 8270 C	3-METHYLPHENOL (M-CRESOL)	PA
EPA 8270 C	3-NITROANILINE	PA	EPA 8270 C	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA
EPA 8270 C	4-AMINOBIPHENYL	PA	EPA 8270 C	4-BROMOPHENYL PHENYL ETHER	PA
EPA 8270 C	4-CHLORO-3-METHYLPHENOL	PA	EPA 8270 C	4-CHLOROANILINE	PA
EPA 8270 C	4-CHLOROPHENYL PHENYLETHER	PA	EPA 8270 C	4-DIMETHYL AMINOAZOBENZENE	PA
EPA 8270 C	4-METHYLPHENOL (P-CRESOL)	PA	EPA 8270 C	4-NITROANILINE	PA
EPA 8270 C	4-NITROPHENOL	PA	EPA 8270 C	4-NITROQUINOLINE-1-OXIDE	PA
EPA 8270 C	5-NITRO-O-TOLUIDINE	PA	EPA 8270 C	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA
EPA 8270 C	A-A-DIMETHYLPHENETHYLAMINE	PA	EPA 8270 C	ACENAPHTHENE	PA
EPA 8270 C	ACENAPHTHYLENE	PA	EPA 8270 C	ACETOPHENONE	PA
EPA 8270 C	ANILINE	PA	EPA 8270 C	ANTHRACENE	PA
EPA 8270 C	ARAMITE	PA	EPA 8270 C	BENZIDINE	PA
EPA 8270 C	BENZO(A)ANTHRACENE	PA	EPA 8270 C	BENZO(A)PYRENE	PA
EPA 8270 C	BENZO(B)FLUORANTHENE	PA	EPA 8270 C	BENZO(G,H,I)PERYLENE	PA
EPA 8270 C	BENZO(K)FLUORANTHENE	PA	EPA 8270 C	BENZOIC ACID	PA
EPA 8270 C	BENZYL ALCOHOL	PA	EPA 8270 C	BIS(2-CHLOROETHOXY)METHANE	PA
EPA 8270 C	BIS(2-CHLOROETHYL) ETHER	PA	EPA 8270 C	BIS(2-CHLOROISOPROPYL) ETHER	PA
EPA 8270 C	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA	EPA 8270 C	BUTYL BENZYL PHTHALATE	PA
EPA 8270 C	CHLOROBENZILATE	PA	EPA 8270 C	CHRYSENE	PA
EPA 8270 C	DI-N-BUTYL PHTHALATE	PA	EPA 8270 C	DI-N-OCTYL PHTHALATE	PA
EPA 8270 C	DIALLATE	PA	EPA 8270 C	DIBENZ(A, J) ACRIDINE	PA
EPA 8270 C	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 C	DIBENZOFURAN	PA
EPA 8270 C	DIETHYL PHTHALATE	PA	EPA 8270 C	DIMETHOATE	PA
EPA 8270 C	DIMETHYL PHTHALATE	PA	EPA 8270 C	DIPHENYLAMINE	PA
EPA 8270 C	DISULFOTON	PA	EPA 8270 C	ETHYL METHANESULFONATE	PA
EPA 8270 C	FAMPHUR	PA	EPA 8270 C	FLUORANTHENE	PA
EPA 8270 C	FLUORENE	PA	EPA 8270 C	HEXACHLOROBENZENE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 C	HEXACHLOROCYCLOPENTADIENE	PA
EPA 8270 C	HEXACHLOROETHANE	PA	EPA 8270 C	HEXACHLOROPROPENE	PA
EPA 8270 C	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C	ISODRIN	PA
EPA 8270 C	ISOPHORONE	PA	EPA 8270 C	ISOSAFROLE	PA
EPA 8270 C	KEPONE	PA	EPA 8270 C	METHAPYRILENE	PA
EPA 8270 C	METHYL METHANESULFONATE	PA	EPA 8270 C	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 C	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 C	N-NITROSODI-N-PROPYLAMINE	PA
EPA 8270 C	N-NITROSODIETHYLAMINE	PA	EPA 8270 C	N-NITROSODIMETHYLAMINE	PA
EPA 8270 C	N-NITROSODIPHENYLAMINE	PA	EPA 8270 C	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 C	N-NITROSOMORPHOLINE	PA	EPA 8270 C	N-NITROSOPIPERIDINE	PA
EPA 8270 C	N-NITROSOPYRROLIDINE	PA	EPA 8270 C	NAPHTHALENE	PA
EPA 8270 C	NITROBENZENE	PA	EPA 8270 C	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA
EPA 8270 C	O-TOLUIDINE (2-METHYLANILINE)	PA	EPA 8270 C	PARATHION (PARATHION - ETHYL)	PA
EPA 8270 C	PENTACHLOROBENZENE	PA	EPA 8270 C	PENTACHLORONITROBENZENE	PA
EPA 8270 C	PENTACHLOROPHENOL	PA	EPA 8270 C	PHENACETIN	PA
EPA 8270 C	PHENANTHRENE	PA	EPA 8270 C	PHENOL	PA
EPA 8270 C	PHORATE	PA	EPA 8270 C	PHTHALIC ANHYDRIDE	PA
EPA 8270 C	PRONAMIDE (KERB)	PA	EPA 8270 C	PYRENE	PA
EPA 8270 C	PYRIDINE	PA	EPA 8270 C	SAFROLE	PA
EPA 8270 C	THIONAZIN (ZINOPHOS)	PA	EPA 8270 C	THIOPHENOL (BENZENETHIOL)	PA
EPA 8270 C	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA	EPA 8270 C SIM	2-METHYLNAPHTHALENE	PA
EPA 8270 C SIM	ACENAPHTHENE	PA	EPA 8270 C SIM	ACENAPHTHYLENE	PA
EPA 8270 C SIM	ANTHRACENE	PA	EPA 8270 C SIM	BENZO(A)ANTHRACENE	PA
EPA 8270 C SIM	BENZO(A)PYRENE	PA	EPA 8270 C SIM	BENZO(B)FLUORANTHENE	PA
EPA 8270 C SIM	BENZO(G,H,I)PERYLENE	PA	EPA 8270 C SIM	BENZO(K)FLUORANTHENE	PA
EPA 8270 C SIM	CHRYSENE	PA	EPA 8270 C SIM	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 C SIM	FLUORANTHENE	PA	EPA 8270 C SIM	FLUORENE	PA
EPA 8270 C SIM	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C SIM	NAPHTHALENE	PA
EPA 8270 C SIM	PHENANTHRENE	PA	EPA 8270 C SIM	PYRENE	PA
EPA 8270 C SIM - EXTENDED	1-METHYLNAPHTHALENE	PA	EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	PA
EPA 8270 D	1,2,4-TRICHLOROBENZENE	PA	EPA 8270 D	1,2-DICHLOROBENZENE	PA
EPA 8270 D	1,2-DIPHENYLHYDRAZINE	PA	EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA
EPA 8270 D	1,3-DICHLOROBENZENE	PA	EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	PA
EPA 8270 D	1,4-DICHLOROBENZENE	PA	EPA 8270 D	1,4-DINITROBENZENE	PA
EPA 8270 D	1,4-NAPHTHOQUINONE	PA	EPA 8270 D	1,4-PHENYLENEDIAMINE	PA
EPA 8270 D	1-CHLORONAPHTHALENE	PA	EPA 8270 D	1-NAPHTHYLAMINE	PA

Commonwealth of Virginia

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	PA	EPA 8270 D	2,4,5-TRICHLOROPHENOL	PA
EPA 8270 D	2,4,6-TRICHLOROPHENOL	PA	EPA 8270 D	2,4-DICHLOROPHENOL	PA
EPA 8270 D	2,4-DIMETHYLPHENOL	PA	EPA 8270 D	2,4-DINITROPHENOL	PA
EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8270 D	2,6-DICHLOROPHENOL	PA
EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 8270 D	2-ACETYLAMINOFLUORENE	PA
EPA 8270 D	2-CHLORONAPHTHALENE	PA	EPA 8270 D	2-CHLOROPHENOL	PA
EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA	EPA 8270 D	2-METHYLNAPHTHALENE	PA
EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	PA	EPA 8270 D	2-NAPHTHYLAMINE	PA
EPA 8270 D	2-NITROANILINE	PA	EPA 8270 D	2-NITROPHENOL	PA
EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	PA	EPA 8270 D	3,3'-DICHLOROBENZIDINE	PA
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	PA	EPA 8270 D	3-METHYLCHOLANTHRENE	PA
EPA 8270 D	3-METHYLPHENOL (M-CRESOL)	PA	EPA 8270 D	3-NITROANILINE	PA
EPA 8270 D	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA	EPA 8270 D	4-AMINOBIPHENYL	PA
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	PA	EPA 8270 D	4-CHLORO-3-METHYLPHENOL	PA
EPA 8270 D	4-CHLOROANILINE	PA	EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	PA
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	PA	EPA 8270 D	4-METHYLPHENOL (P-CRESOL)	PA
EPA 8270 D	4-NITROANILINE	PA	EPA 8270 D	4-NITROPHENOL	PA
EPA 8270 D	4-NITROQUINOLINE-1-OXIDE	PA	EPA 8270 D	5-NITRO-O-TOLUIDINE	PA
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA	EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	PA
EPA 8270 D	ACENAPHTHENE	PA	EPA 8270 D	ACENAPHTHYLENE	PA
EPA 8270 D	ACETOPHENONE	PA	EPA 8270 D	ANILINE	PA
EPA 8270 D	ANTHRACENE	PA	EPA 8270 D	ARAMITE	PA
EPA 8270 D	BENZIDINE	PA	EPA 8270 D	BENZO(A)ANTHRACENE	PA
EPA 8270 D	BENZO(A)PYRENE	PA	EPA 8270 D	BENZO(B)FLUORANTHENE	PA
EPA 8270 D	BENZO(G,H,I)PERYLENE	PA	EPA 8270 D	BENZO(K)FLUORANTHENE	PA
EPA 8270 D	BENZOIC ACID	PA	EPA 8270 D	BENZYL ALCOHOL	PA
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	PA
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 8270 D	BUTYL BENZYL PHTHALATE	PA	EPA 8270 D	CHLOROBENZILATE	PA
EPA 8270 D	CHRYSENE	PA	EPA 8270 D	DI-N-BUTYL PHTHALATE	PA
EPA 8270 D	DI-N-OCTYL PHTHALATE	PA	EPA 8270 D	DIALLATE	PA
EPA 8270 D	DIBENZ(A, J) ACRIDINE	PA	EPA 8270 D	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 D	DIBENZOFURAN	PA	EPA 8270 D	DIETHYL PHTHALATE	PA
EPA 8270 D	DIMETHOATE	PA	EPA 8270 D	DIMETHYL PHTHALATE	PA
EPA 8270 D	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA	EPA 8270 D	DIPHENYLAMINE	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	DISULFOTON	PA	EPA 8270 D	ETHYL METHANESULFONATE	PA
EPA 8270 D	FAMPHUR	PA	EPA 8270 D	FLUORANTHENE	PA
EPA 8270 D	FLUORENE	PA	EPA 8270 D	HEXACHLOROBENZENE	PA
EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	PA
EPA 8270 D	HEXACHLOROETHANE	PA	EPA 8270 D	HEXACHLOROPROPENE	PA
EPA 8270 D	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 D	ISODRIN	PA
EPA 8270 D	ISOPHORONE	PA	EPA 8270 D	ISOSAFROLE	PA
EPA 8270 D	KEPONE	PA	EPA 8270 D	METHAPYRILENE	PA
EPA 8270 D	METHYL METHANESULFONATE	PA	EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	PA
EPA 8270 D	N-NITROSODIETHYLAMINE	PA	EPA 8270 D	N-NITROSODIMETHYLAMINE	PA
EPA 8270 D	N-NITROSODIPHENYLAMINE	PA	EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 D	N-NITROSOMORPHOLINE	PA	EPA 8270 D	N-NITROSOPIPERIDINE	PA
EPA 8270 D	N-NITROSOPYRROLIDINE	PA	EPA 8270 D	NAPHTHALENE	PA
EPA 8270 D	NITROBENZENE	PA	EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA
EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	PA	EPA 8270 D	PARATHION (PARATHION - ETHYL)	PA
EPA 8270 D	PENTACHLOROBENZENE	PA	EPA 8270 D	PENTACHLORONITROBENZENE	PA
EPA 8270 D	PENTACHLOROPHENOL	PA	EPA 8270 D	PHENACETIN	PA
EPA 8270 D	PHENANTHRENE	PA	EPA 8270 D	PHENOL	PA
EPA 8270 D	PHORATE	PA	EPA 8270 D	PHTHALIC ANHYDRIDE	PA
EPA 8270 D	PRONAMIDE (KERB)	PA	EPA 8270 D	PYRENE	PA
EPA 8270 D	SAFROLE	PA	EPA 8270 D	THIONAZIN (ZINOPHOS)	PA
EPA 8270 D	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA	EPA 8270 D - EXTENDED	1,1'-BIPHENYL	PA
EPA 8270 D - EXTENDED	1-METHYLNAPHTHALENE	PA	EPA 8270 D - EXTENDED	ATRAZINE	PA
EPA 8270 D - EXTENDED	BENZALDEHYDE	PA	EPA 8270 D - EXTENDED	CAPROLACTAM	PA
EPA 8270 D - EXTENDED	CARBAZOLE	PA	EPA 8270 D - EXTENDED	PYRIDINE	PA
EPA 8270 D SIM	2-METHYLNAPHTHALENE	PA	EPA 8270 D SIM	ACENAPHTHENE	PA
EPA 8270 D SIM	ACENAPHTHYLENE	PA	EPA 8270 D SIM	ANTHRACENE	PA
EPA 8270 D SIM	BENZO(A)ANTHRACENE	PA	EPA 8270 D SIM	BENZO(A)PYRENE	PA
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	PA	EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	PA
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	PA	EPA 8270 D SIM	CHRYSENE	PA
EPA 8270 D SIM	FLUORANTHENE	PA	EPA 8270 D SIM	FLUORENE	PA
EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 D SIM	NAPHTHALENE	PA
EPA 8270 D SIM	PHENANTHRENE	PA	EPA 8270 D SIM	PYRENE	PA
EPA 8270 D SIM - EXTENDED	1-METHYLNAPHTHALENE	PA	EPA 8270 D SIM - EXTENDED	DIBENZO(A,H) PYRENE	PA
EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA

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NON-POTABLE WATER

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EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA
EPA 8290 A	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA	EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA
EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (1,2,3,7,8,9-HXCDF)	PA	EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (1,2,3,7,8-PECDD)	PA
EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZOFURAN (1,2,3,7,8-PECDF)	PA	EPA 8290 A	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (2,3,4,6,7,8-HXCDF)	PA
EPA 8290 A	2,3,4,7,8-PENTACHLORODIBENZOFURAN	PA	EPA 8290 A	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA
EPA 8290 A	2,3,7,8-TETRACHLORODIBENZOFURAN (2,3,7,8-TCDF)	PA	EPA 8315 A	ACETALDEHYDE	PA
EPA 8315 A	BENZALDEHYDE	PA	EPA 8315 A	BUTYLALDEHYDE (BUTANAL)	PA
EPA 8315 A	CROTONALDEHYDE	PA	EPA 8315 A	FORMALDEHYDE	PA
EPA 8315 A	HEXANALDEHYDE (HEXANAL)	PA	EPA 8315 A	ISOVALERALDEHYDE	PA
EPA 8315 A	M-TOLUALDEHYDE (1,3-TOLUALDEHYDE)	PA	EPA 8315 A	O-TOLUALDEHYDE (1,2-TOLUALDEHYDE)	PA
EPA 8315 A	P-TOLUALDEHYDE (1,4-TOLUALDEHYDE)	PA	EPA 8315 A	PENTANAL (VALERALDEHYDE)	PA
EPA 8315 A	PROPIONALDEHYDE (PROPANAL)	PA	EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA
EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	PA
EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	PA	EPA 8330 A	2-NITROTOLUENE	PA
EPA 8330 A	3-NITROTOLUENE	PA	EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	PA
EPA 8330 A	4-NITROTOLUENE	PA	EPA 8330 A	METHYL-2,4,6-TRINITROPHENYLNITRAMINE (TETRYL)	PA
EPA 8330 A	NITROBENZENE	PA	EPA 8330 A	NITROGLYCERIN	PA
EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	PA	EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	PA
EPA 9012 A	TOTAL CYANIDE	PA	EPA 9012 B	TOTAL CYANIDE	PA
EPA 9040 C	PH	PA	EPA 9050 A	CONDUCTIVITY	PA
EPA 9056 A	BROMIDE	PA	EPA 9056 A	CHLORIDE	PA
EPA 9056 A	FLUORIDE	PA	EPA 9056 A	NITRATE AS N	PA
EPA 9056 A	NITRITE	PA	EPA 9056 A	SULFATE	PA
EPA 9066	TOTAL PHENOLICS	PA	OIA-1677-09	AMENABLE CYANIDE	PA
OIA-1677-09	FREE CYANIDE	PA	RSK-175	ETHANE	PA
RSK-175	ETHENE	PA	RSK-175	METHANE	PA
SM 2120 B-2001	COLOR	PA	SM 2310 B-1997	ACIDITY, AS CACO3	PA

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NON-POTABLE WATER

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
SM 2320 B-1997	ALKALINITY AS CACO3	PA	SM 2340 C-1997	TOTAL HARDNESS AS CACO3	PA
SM 2510 B-1997	CONDUCTIVITY	PA	SM 2540 B-1997	RESIDUE-TOTAL	PA
SM 2540 C-1997	RESIDUE-FILTERABLE (TDS)	PA	SM 2540 D-1997	RESIDUE-NONFILTERABLE (TSS)	PA
SM 2540 F-1997	RESIDUE-SETTLEABLE	PA	SM 3500-CR B-2009	CHROMIUM VI	PA
SM 4500-F⁻ B-1997	FLUORIDE	PA	SM 4500-F⁻ C-1997	FLUORIDE	PA
SM 4500-NH3 B-1997	AMMONIA AS N	PA	SM 4500-NH3 D-1997	AMMONIA AS N	PA
SM 4500-P E-1999	ORTHOPHOSPHATE AS P	PA	SM 4500-P F-1999	PHOSPHORUS, TOTAL	PA
SM 4500-S2⁻ D-2000	SULFIDE	PA	SM 4500-SIO2 C-1997	SILICA AS SIO2	PA
SM 5210 B-2001	BIOCHEMICAL OXYGEN DEMAND	PA	SM 5210 B-2001	CARBONACEOUS BOD, CBOD	PA
SM 5310 C-2000	TOTAL ORGANIC CARBON	PA	SM 5540 C-2000	SURFACTANTS - MBAS	PA
SM 9222 D-1997	FECAL COLIFORMS	PA			

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1010 A	FLASHPOINT	PA	EPA 1311	PREP: TOXICITY CHARACTERISTIC LEACHING PROCEDURE	PA
EPA 1312	PREP: SYNTHETIC PRECIPITATION LEACHING PROCEDURE	PA	EPA 1668 A	2,2',3,3',4,4',5,5',6-NONACHLOROBIPHENYL (BZ-206)	PA
EPA 1668 A	2,2',3,3',4,4',5,5'-OCTACHLOROBIPHENYL (BZ-194)	PA	EPA 1668 A	2,2',3,3',4,4',5,6'-OCTACHLOROBIPHENYL (BZ-196)	PA
EPA 1668 A	2,2',3,3',4,4',5,6,6'-NONACHLOROBIPHENYL (BZ-207)	PA	EPA 1668 A	2,2',3,3',4,4',5,6-OCTACHLOROBIPHENYL BZ-195)	PA
EPA 1668 A	2,2',3,3',4,4',5-HEPTACHLOROBIPHENYL (BZ-170)	PA	EPA 1668 A	2,2',3,3',4,4',6,6'-OCTACHLOROBIPHENYL (BZ-197)	PA
EPA 1668 A	2,2',3,3',4,4',6-HEPTACHLOROBIPHENYL (BZ-171)	PA	EPA 1668 A	2,2',3,3',4,4'-HEXACHLOROBIPHENYL (BZ-128)	PA
EPA 1668 A	2,2',3,3',4,5',6'-HEPTACHLOROBIPHENYL (BZ-177)	PA	EPA 1668 A	2,2',3,3',4,5',6,6'-OCTACHLOROBIPHENYL (BZ-201)	PA
EPA 1668 A	2,2',3,3',4,5',6-HEPTACHLOROBIPHENYL (BZ-175)	PA	EPA 1668 A	2,2',3,3',4,5'-HEXACHLOROBIPHENYL (BZ-130)	PA
EPA 1668 A	2,2',3,3',4,5,5',6'-OCTACHLOROBIPHENYL (BZ-199)	PA	EPA 1668 A	2,2',3,3',4,5,5',6,6'-NONACHLOROBIPHENYL (BZ-208)	PA
EPA 1668 A	2,2',3,3',4,5,5',6-OCTACHLOROBIPHENYL (BZ-198)	PA	EPA 1668 A	2,2',3,3',4,5,5'-HEPTACHLOROBIPHENYL (BZ-172)	PA
EPA 1668 A	2,2',3,3',4,5,6'-HEPTACHLOROBIPHENYL (BZ-174)	PA	EPA 1668 A	2,2',3,3',4,5,6,6'-OCTACHLOROBIPHENYL (BZ-200)	PA
EPA 1668 A	2,2',3,3',4,5,6-HEPTACHLOROBIPHENYL (BZ-173)	PA	EPA 1668 A	2,2',3,3',4,5-HEXACHLOROBIPHENYL (BZ-129)	PA
EPA 1668 A	2,2',3,3',4,6'-HEXACHLOROBIPHENYL (BZ-132)	PA	EPA 1668 A	2,2',3,3',4,6,6'-HEPTACHLOROBIPHENYL (BZ-176)	PA
EPA 1668 A	2,2',3,3',4,6-HEXACHLOROBIPHENYL (BZ-131)	PA	EPA 1668 A	2,2',3,3',4-PENTACHLOROBIPHENYL (BZ-82)	PA
EPA 1668 A	2,2',3,3',5,5',6,6'-OCTACHLOROBIPHENYL (BZ-202)	PA	EPA 1668 A	2,2',3,3',5,5',6-HEPTACHLOROBIPHENYL (BZ-178)	PA
EPA 1668 A	2,2',3,3',5,5'-HEXACHLOROBIPHENYL (BZ-133)	PA	EPA 1668 A	2,2',3,3',5,6'-HEXACHLOROBIPHENYL (BZ-135)	PA

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METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1668 A	2,2',3,3',5,6,6'-HEPTACHLOROBIPHENYL (BZ-179)	PA	EPA 1668 A	2,2',3,3',5,6-HEXACHLOROBIPHENYL (BZ-134)	PA
EPA 1668 A	2,2',3,3',5-PENTACHLOROBIPHENYL (BZ-83)	PA	EPA 1668 A	2,2',3,3',6,6'-HEXACHLOROBIPHENYL (BZ-136)	PA
EPA 1668 A	2,2',3,3',6-PENTACHLOROBIPHENYL (BZ-84)	PA	EPA 1668 A	2,2',3,3'-TETRACHLOROBIPHENYL (BZ-40)	PA
EPA 1668 A	2,2',3,4',5',6-HEXACHLOROBIPHENYL (BZ-149)	PA	EPA 1668 A	2,2',3,4',5'-PENTACHLOROBIPHENYL (BZ-97)	PA
EPA 1668 A	2,2',3,4',5,5',6-HEPTACHLOROBIPHENYL (BZ-187)	PA	EPA 1668 A	2,2',3,4',5,5'-HEXACHLOROBIPHENYL (BZ-146)	PA
EPA 1668 A	2,2',3,4',5,6'-HEXACHLOROBIPHENYL (BZ-148)	PA	EPA 1668 A	2,2',3,4',5,6,6'-HEPTACHLOROBIPHENYL (BZ-188)	PA
EPA 1668 A	2,2',3,4',5,6-HEXACHLOROBIPHENYL (BZ-147)	PA	EPA 1668 A	2,2',3,4',5-PENTACHLOROBIPHENYL (BZ-90)	PA
EPA 1668 A	2,2',3,4',6'-PENTACHLOROBIPHENYL (BZ-98)	PA	EPA 1668 A	2,2',3,4',6,6'-HEXACHLOROBIPHENYL (BZ-150)	PA
EPA 1668 A	2,2',3,4',6-PENTACHLOROBIPHENYL (BZ-91)	PA	EPA 1668 A	2,2',3,4'-TETRACHLOROBIPHENYL (BZ-42)	PA
EPA 1668 A	2,2',3,4,4',5',6-HEPTACHLOROBIPHENYL (BZ-183)	PA	EPA 1668 A	2,2',3,4,4',5'-HEXACHLOROBIPHENYL (BZ-138)	PA
EPA 1668 A	2,2',3,4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-203)	PA	EPA 1668 A	2,2',3,4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-180)	PA
EPA 1668 A	2,2',3,4,4',5,6'-HEPTACHLOROBIPHENYL (BZ-182)	PA	EPA 1668 A	2,2',3,4,4',5,6,6'-OCTACHLOROBIPHENYL (BZ-204)	PA
EPA 1668 A	2,2',3,4,4',5,6-HEPTACHLOROBIPHENYL (BZ-181)	PA	EPA 1668 A	2,2',3,4,4',5-HEXACHLOROBIPHENYL (BZ-137)	PA
EPA 1668 A	2,2',3,4,4',6'-HEXACHLOROBIPHENYL (BZ-140)	PA	EPA 1668 A	2,2',3,4,4',6,6'-HEPTACHLOROBIPHENYL (BZ-184)	PA
EPA 1668 A	2,2',3,4,4',6-HEXACHLOROBIPHENYL (BZ-139)	PA	EPA 1668 A	2,2',3,4,4'-PENTACHLOROBIPHENYL (BZ-85)	PA
EPA 1668 A	2,2',3,4,5',6-HEXACHLOROBIPHENYL (BZ-144)	PA	EPA 1668 A	2,2',3,4,5'-PENTACHLOROBIPHENYL (BZ-87)	PA
EPA 1668 A	2,2',3,4,5,5',6-HEPTACHLOROBIPHENYL (BZ-185)	PA	EPA 1668 A	2,2',3,4,5,5'-HEXACHLOROBIPHENYL (BZ-141)	PA
EPA 1668 A	2,2',3,4,5,6'-HEXACHLOROBIPHENYL (BZ-143)	PA	EPA 1668 A	2,2',3,4,5,6,6'-HEPTACHLOROBIPHENYL (BZ-186)	PA
EPA 1668 A	2,2',3,4,5,6-HEXACHLOROBIPHENYL (BZ-142)	PA	EPA 1668 A	2,2',3,4,5-PENTACHLOROBIPHENYL (BZ-86)	PA
EPA 1668 A	2,2',3,4,6'-PENTACHLOROBIPHENYL (BZ-89)	PA	EPA 1668 A	2,2',3,4,6,6'-HEXACHLOROBIPHENYL (BZ-145)	PA
EPA 1668 A	2,2',3,4,6-PENTACHLOROBIPHENYL (BZ-88)	PA	EPA 1668 A	2,2',3,4-TETRACHLOROBIPHENYL (BZ-41)	PA
EPA 1668 A	2,2',3,5',6-PENTACHLOROBIPHENYL (BZ-95)	PA	EPA 1668 A	2,2',3,5'-TETRACHLOROBIPHENYL (BZ-44)	PA
EPA 1668 A	2,2',3,5,5',6-HEXACHLOROBIPHENYL (BZ-151)	PA	EPA 1668 A	2,2',3,5,5'-PENTACHLOROBIPHENYL (BZ-92)	PA
EPA 1668 A	2,2',3,5,6'-PENTACHLOROBIPHENYL (BZ-94)	PA	EPA 1668 A	2,2',3,5,6,6'-HEXACHLOROBIPHENYL (BZ-152)	PA
EPA 1668 A	2,2',3,5,6-PENTACHLOROBIPHENYL (BZ-93)	PA	EPA 1668 A	2,2',3,5-TETRACHLOROBIPHENYL (BZ-43)	PA

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EPA 1668 A	2,2',3,6'-TETRACHLOROBIPHENYL (BZ-46)	PA	EPA 1668 A	2,2',3,6,6'-PENTACHLOROBIPHENYL (BZ-96)	PA
EPA 1668 A	2,2',3,6-TETRACHLOROBIPHENYL (BZ-45)	PA	EPA 1668 A	2,2',3-TRICHLOROBIPHENYL (BZ-16)	PA
EPA 1668 A	2,2',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-153)	PA	EPA 1668 A	2,2',4,4',5,6'-HEXACHLOROBIPHENYL (BZ-154)	PA
EPA 1668 A	2,2',4,4',5-PENTACHLOROBIPHENYL (BZ-99)	PA	EPA 1668 A	2,2',4,4',6,6'-HEXACHLOROBIPHENYL (BZ-155)	PA
EPA 1668 A	2,2',4,4',6-PENTACHLOROBIPHENYL (BZ-100)	PA	EPA 1668 A	2,2',4,4'-TETRACHLOROBIPHENYL (BZ-47)	PA
EPA 1668 A	2,2',4,5',6-PENTACHLOROBIPHENYL (BZ-103)	PA	EPA 1668 A	2,2',4,5'-TETRACHLOROBIPHENYL (BZ-49)	PA
EPA 1668 A	2,2',4,5,5'-PENTACHLOROBIPHENYL (BZ-101)	PA	EPA 1668 A	2,2',4,5,6'-PENTACHLOROBIPHENYL (BZ-102)	PA
EPA 1668 A	2,2',4,5-TETRACHLOROBIPHENYL (BZ-48)	PA	EPA 1668 A	2,2',4,6'-TETRACHLOROBIPHENYL (BZ-51)	PA
EPA 1668 A	2,2',4,6,6'-PENTACHLOROBIPHENYL (BZ-104)	PA	EPA 1668 A	2,2',4,6-TETRACHLOROBIPHENYL (BZ-50)	PA
EPA 1668 A	2,2',4-TRICHLOROBIPHENYL (BZ-17)	PA	EPA 1668 A	2,2',5,5'-TETRACHLOROBIPHENYL (BZ-52)	PA
EPA 1668 A	2,2',5,6'-TETRACHLOROBIPHENYL (BZ-53)	PA	EPA 1668 A	2,2',5-TRICHLOROBIPHENYL (BZ-18)	PA
EPA 1668 A	2,2',6,6'-TETRACHLOROBIPHENYL (BZ-54)	PA	EPA 1668 A	2,2',6-TRICHLOROBIPHENYL (BZ-19)	PA
EPA 1668 A	2,2'-DICHLOROBIPHENYL (BZ-4)	PA	EPA 1668 A	2,3',4',5',6-PENTACHLOROBIPHENYL (BZ-125)	PA
EPA 1668 A	2,3',4',5'-TETRACHLOROBIPHENYL (BZ-76)	PA	EPA 1668 A	2,3',4',5,5'-PENTACHLOROBIPHENYL (BZ-124)	PA
EPA 1668 A	2,3',4',5-TETRACHLOROBIPHENYL (BZ-70)	PA	EPA 1668 A	2,3',4',6-TETRACHLOROBIPHENYL (BZ-71)	PA
EPA 1668 A	2,3',4'-TRICHLOROBIPHENYL (BZ-33)	PA	EPA 1668 A	2,3',4,4',5',6-HEXACHLOROBIPHENYL (BZ-168)	PA
EPA 1668 A	2,3',4,4',5'-PENTACHLOROBIPHENYL (BZ-123)	PA	EPA 1668 A	2,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-167)	PA
EPA 1668 A	2,3',4,4',5-PENTACHLOROBIPHENYL (BZ-118)	PA	EPA 1668 A	2,3',4,4',6-PENTACHLOROBIPHENYL (BZ-119)	PA
EPA 1668 A	2,3',4,4'-TETRACHLOROBIPHENYL (BZ-66)	PA	EPA 1668 A	2,3',4,5',6-PENTACHLOROBIPHENYL (BZ-121)	PA
EPA 1668 A	2,3',4,5'-TETRACHLOROBIPHENYL (BZ-68)	PA	EPA 1668 A	2,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-120)	PA
EPA 1668 A	2,3',4,5-TETRACHLOROBIPHENYL (BZ-67)	PA	EPA 1668 A	2,3',4,6-TETRACHLOROBIPHENYL (BZ-69)	PA
EPA 1668 A	2,3',4-TRICHLOROBIPHENYL (BZ-25)	PA	EPA 1668 A	2,3',5',6-TETRACHLOROBIPHENYL (BZ-73)	PA
EPA 1668 A	2,3',5'-TRICHLOROBIPHENYL (BZ-34)	PA	EPA 1668 A	2,3',5,5'-TETRACHLOROBIPHENYL (BZ-72)	PA
EPA 1668 A	2,3',5-TRICHLOROBIPHENYL (BZ-26)	PA	EPA 1668 A	2,3',6-TRICHLOROBIPHENYL (BZ-27)	PA
EPA 1668 A	2,3'-DICHLOROBIPHENYL (BZ-6)	PA	EPA 1668 A	2,3,3',4',5',6-HEXACHLOROBIPHENYL (BZ-164)	PA

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EPA 1668 A	2,3,3',4',5'-PENTACHLOROBIPHENYL (BZ-122)	PA
EPA 1668 A	2,3,3',4',5,5'-HEXACHLOROBIPHENYL (BZ-162)	PA
EPA 1668 A	2,3,3',4',5-PENTACHLOROBIPHENYL (BZ-107)	PA
EPA 1668 A	2,3,3',4'-TETRACHLOROBIPHENYL (BZ-56)	PA
EPA 1668 A	2,3,3',4,4',5'-HEXACHLOROBIPHENYL (BZ-157)	PA
EPA 1668 A	2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (BZ-189)	PA
EPA 1668 A	2,3,3',4,4',5-HEXACHLOROBIPHENYL (BZ-156)	PA
EPA 1668 A	2,3,3',4,4'-PENTACHLOROBIPHENYL (BZ-105)	PA
EPA 1668 A	2,3,3',4,5'-PENTACHLOROBIPHENYL (BZ-108)	PA
EPA 1668 A	2,3,3',4,5,5'-HEXACHLOROBIPHENYL (BZ-159)	PA
EPA 1668 A	2,3,3',4,5-PENTACHLOROBIPHENYL (BZ-106)	PA
EPA 1668 A	2,3,3',4-TETRACHLOROBIPHENYL (BZ-55)	PA
EPA 1668 A	2,3,3',5'-TETRACHLOROBIPHENYL (BZ-58)	PA
EPA 1668 A	2,3,3',5,5'-PENTACHLOROBIPHENYL (BZ-111)	PA
EPA 1668 A	2,3,3',5-TETRACHLOROBIPHENYL (BZ-57)	PA
EPA 1668 A	2,3,3'-TRICHLOROBIPHENYL (BZ-20)	PA
EPA 1668 A	2,3,4',5-TETRACHLOROBIPHENYL (BZ-63)	PA
EPA 1668 A	2,3,4'-TRICHLOROBIPHENYL (BZ-22)	PA
EPA 1668 A	2,3,4,4',5-PENTACHLOROBIPHENYL (BZ-114)	PA
EPA 1668 A	2,3,4,4'-TETRACHLOROBIPHENYL (BZ-60)	PA
EPA 1668 A	2,3,4,5-TETRACHLOROBIPHENYL (BZ-61)	PA
EPA 1668 A	2,3,4-TRICHLOROBIPHENYL (BZ-21)	PA
EPA 1668 A	2,3,5-TRICHLOROBIPHENYL (BZ-23)	PA
EPA 1668 A	2,3-DICHLOROBIPHENYL (BZ-5)	PA
EPA 1668 A	2,4',6-TRICHLOROBIPHENYL (BZ-32)	PA
EPA 1668 A	2,4,4',5-TETRACHLOROBIPHENYL (BZ-74)	PA
EPA 1668 A	2,4,4'-TRICHLOROBIPHENYL (BZ-28)	PA
EPA 1668 A	2,3,3',4',5,5',6-HEPTACHLOROBIPHENYL (BZ-193)	PA
EPA 1668 A	2,3,3',4',5,6-HEXACHLOROBIPHENYL (BZ-163)	PA
EPA 1668 A	2,3,3',4',6-PENTACHLOROBIPHENYL (BZ-110)	PA
EPA 1668 A	2,3,3',4,4',5',6-HEPTACHLOROBIPHENYL (BZ-191)	PA
EPA 1668 A	2,3,3',4,4',5,5',6-OCTACHLOROBIPHENYL (BZ-205)	PA
EPA 1668 A	2,3,3',4,4',5,6-HEPTACHLOROBIPHENYL (BZ-190)	PA
EPA 1668 A	2,3,3',4,4',6-HEXACHLOROBIPHENYL (BZ-158)	PA
EPA 1668 A	2,3,3',4,5',6-HEXACHLOROBIPHENYL (BZ-161)	PA
EPA 1668 A	2,3,3',4,5,5',6-HEPTACHLOROBIPHENYL (BZ-192)	PA
EPA 1668 A	2,3,3',4,5,6-HEXACHLOROBIPHENYL (BZ-160)	PA
EPA 1668 A	2,3,3',4,6-PENTACHLOROBIPHENYL (BZ-109)	PA
EPA 1668 A	2,3,3',5',6-PENTACHLOROBIPHENYL (BZ-113)	PA
EPA 1668 A	2,3,3',5,5',6-HEXACHLOROBIPHENYL (BZ-165)	PA
EPA 1668 A	2,3,3',5,6-PENTACHLOROBIPHENYL (BZ-112)	PA
EPA 1668 A	2,3,3',6-TETRACHLOROBIPHENYL (BZ-59)	PA
EPA 1668 A	2,3,4',5,6-PENTACHLOROBIPHENYL (BZ-117)	PA
EPA 1668 A	2,3,4',6-TETRACHLOROBIPHENYL (BZ-64)	PA
EPA 1668 A	2,3,4,4',5,6-HEXACHLOROBIPHENYL (BZ-166)	PA
EPA 1668 A	2,3,4,4',6-PENTACHLOROBIPHENYL (BZ-115)	PA
EPA 1668 A	2,3,4,5,6-PENTACHLOROBIPHENYL (BZ-116)	PA
EPA 1668 A	2,3,4,6-TETRACHLOROBIPHENYL (BZ-62)	PA
EPA 1668 A	2,3,5,6-TETRACHLOROBIPHENYL (BZ-65)	PA
EPA 1668 A	2,3,6-TRICHLOROBIPHENYL (BZ-24)	PA
EPA 1668 A	2,4',5-TRICHLOROBIPHENYL (BZ-31)	PA
EPA 1668 A	2,4'-DICHLOROBIPHENYL (BZ-8)	PA
EPA 1668 A	2,4,4',6-TETRACHLOROBIPHENYL (BZ-75)	PA

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2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 1668 A	2,4,5-TRICHLOROBIPHENYL (BZ-29)	PA	EPA 1668 A	2,4,6-TRICHLOROBIPHENYL (BZ-30)	PA
EPA 1668 A	2,4-DICHLOROBIPHENYL (BZ-7)	PA	EPA 1668 A	2,5-DICHLOROBIPHENYL (BZ-9)	PA
EPA 1668 A	2,6-DICHLOROBIPHENYL (BZ-10)	PA	EPA 1668 A	2-CHLOROBIPHENYL (BZ-1)	PA
EPA 1668 A	3,3',4,4',5,5'-HEXACHLOROBIPHENYL (BZ-169)	PA	EPA 1668 A	3,3',4,4',5-PENTACHLOROBIPHENYL (BZ-126)	PA
EPA 1668 A	3,3',4,4'-TETRACHLOROBIPHENYL (BZ-77)	PA	EPA 1668 A	3,3',4,5'-TETRACHLOROBIPHENYL (BZ-79)	PA
EPA 1668 A	3,3',4,5,5'-PENTACHLOROBIPHENYL (BZ-127)	PA	EPA 1668 A	3,3',4,5-TETRACHLOROBIPHENYL (BZ-78)	PA
EPA 1668 A	3,3',4-TRICHLOROBIPHENYL (BZ-35)	PA	EPA 1668 A	3,3',5,5'-TETRACHLOROBIPHENYL (BZ-80)	PA
EPA 1668 A	3,3',5-TRICHLOROBIPHENYL (BZ-36)	PA	EPA 1668 A	3,3'-DICHLOROBIPHENYL (BZ-11)	PA
EPA 1668 A	3,4',5-TRICHLOROBIPHENYL (BZ-39)	PA	EPA 1668 A	3,4'-DICHLOROBIPHENYL (BZ-13)	PA
EPA 1668 A	3,4,4',5-TETRACHLOROBIPHENYL (BZ-81)	PA	EPA 1668 A	3,4,4'-TRICHLOROBIPHENYL (BZ-37)	PA
EPA 1668 A	3,4,5-TRICHLOROBIPHENYL (BZ-38)	PA	EPA 1668 A	3,4-DICHLOROBIPHENYL (BZ-12)	PA
EPA 1668 A	3,5-DICHLOROBIPHENYL (BZ-14)	PA	EPA 1668 A	3-CHLOROBIPHENYL (BZ-2)	PA
EPA 1668 A	4,4'-DICHLOROBIPHENYL (BZ-15)	PA	EPA 1668 A	4-CHLOROBIPHENYL (BZ-3)	PA
EPA 1668 A	DECACHLOROBIPHENYL (BZ-209)	PA	EPA 3050 B	PREP: ACID DIGESTION OF SEDIMENTS, SLUDGES, AND SOILS	PA
EPA 3540 C	PREP: SOXHLET EXTRACTION	PA	EPA 3546	PREP: MICROWAVE EXTRACTION	PA
EPA 3550 B	PREP: ULTRASONIC EXTRACTION	PA	EPA 3620 B	PREP: FLORISIL CLEANUP	PA
EPA 3630 C	PREP: SILICA GEL CLEANUP	PA	EPA 3640 A	PREP: GEL PERMEATION CLEANUP	PA
EPA 3660 B	PREP: SULFUR CLEANUP	PA	EPA 3665 A	SULFURIC ACID/PERMANGANATE CLEAN-UP	PA
EPA 5030 B	PREP: PURGE AND TRAP FOR AQUEOUS SAMPLES	PA	EPA 5035	PREP: CLOSED-SYSTEM PURGE AND TRAP AND EXTRACTION	PA
EPA 6010 B	ALUMINUM	PA	EPA 6010 B	ANTIMONY	PA
EPA 6010 B	ARSENIC	PA	EPA 6010 B	BARIUM	PA
EPA 6010 B	BERYLLIUM	PA	EPA 6010 B	BORON	PA
EPA 6010 B	CADMIUM	PA	EPA 6010 B	CALCIUM	PA
EPA 6010 B	CHROMIUM	PA	EPA 6010 B	COBALT	PA
EPA 6010 B	COPPER	PA	EPA 6010 B	IRON	PA
EPA 6010 B	LEAD	PA	EPA 6010 B	MAGNESIUM	PA
EPA 6010 B	MANGANESE	PA	EPA 6010 B	MOLYBDENUM	PA
EPA 6010 B	NICKEL	PA	EPA 6010 B	POTASSIUM	PA
EPA 6010 B	SELENIUM	PA	EPA 6010 B	SILVER	PA
EPA 6010 B	SODIUM	PA	EPA 6010 B	STRONTIUM	PA
EPA 6010 B	THALLIUM	PA	EPA 6010 B	TIN	PA
EPA 6010 B	TITANIUM	PA	EPA 6010 B	VANADIUM	PA
EPA 6010 B	ZINC	PA	EPA 6010 C	ALUMINUM	PA
EPA 6010 C	ANTIMONY	PA	EPA 6010 C	ARSENIC	PA
EPA 6010 C	BARIUM	PA	EPA 6010 C	BERYLLIUM	PA

Commonwealth of Virginia

Department of General Services
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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 6010 C	BORON	PA	EPA 6010 C	CADMIUM	PA
EPA 6010 C	CALCIUM	PA	EPA 6010 C	CHROMIUM	PA
EPA 6010 C	COBALT	PA	EPA 6010 C	COPPER	PA
EPA 6010 C	IRON	PA	EPA 6010 C	LEAD	PA
EPA 6010 C	MAGNESIUM	PA	EPA 6010 C	MANGANESE	PA
EPA 6010 C	MOLYBDENUM	PA	EPA 6010 C	NICKEL	PA
EPA 6010 C	POTASSIUM	PA	EPA 6010 C	SELENIUM	PA
EPA 6010 C	SILVER	PA	EPA 6010 C	SODIUM	PA
EPA 6010 C	STRONTIUM	PA	EPA 6010 C	THALLIUM	PA
EPA 6010 C	TIN	PA	EPA 6010 C	TITANIUM	PA
EPA 6010 C	VANADIUM	PA	EPA 6010 C	ZINC	PA
EPA 6020 A	ALUMINUM	PA	EPA 6020 A	ANTIMONY	PA
EPA 6020 A	ARSENIC	PA	EPA 6020 A	BERYLLIUM	PA
EPA 6020 A	CADMIUM	PA	EPA 6020 A	CALCIUM	PA
EPA 6020 A	CHROMIUM	PA	EPA 6020 A	COBALT	PA
EPA 6020 A	COPPER	PA	EPA 6020 A	IRON	PA
EPA 6020 A	LEAD	PA	EPA 6020 A	MAGNESIUM	PA
EPA 6020 A	MANGANESE	PA	EPA 6020 A	NICKEL	PA
EPA 6020 A	POTASSIUM	PA	EPA 6020 A	SELENIUM	PA
EPA 6020 A	SILVER	PA	EPA 6020 A	SODIUM	PA
EPA 6020 A	THALLIUM	PA	EPA 6020 A	VANADIUM	PA
EPA 6020 A	ZINC	PA	EPA 6020 A - EXTENDED	BORON	PA
EPA 6020 A - EXTENDED	STRONTIUM	PA	EPA 6020 A - EXTENDED	TIN	PA
EPA 6020 A - EXTENDED	TITANIUM	PA	EPA 6850	PERCHLORATE	PA
EPA 7196 A	CHROMIUM VI	PA	EPA 7471 A	MERCURY	PA
EPA 7471 B	MERCURY	PA	EPA 8015 B	DIESEL RANGE ORGANICS (DRO)	PA
EPA 8015 B	ETHANOL	PA	EPA 8015 B	ETHYLENE GLYCOL	PA
EPA 8015 B	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8015 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 B	METHANOL	PA	EPA 8015 C	ETHANOL	PA
EPA 8015 C	ETHYLENE GLYCOL	PA	EPA 8015 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8015 C	METHANOL	PA	EPA 8021 B	BENZENE	PA
EPA 8021 B	ETHYLBENZENE	PA	EPA 8021 B	ISOPROPYLBENZENE	PA
EPA 8021 B	M+P-XYLENE	PA	EPA 8021 B	NAPHTHALENE	PA
EPA 8021 B	O-XYLENE	PA	EPA 8021 B	TOLUENE	PA
EPA 8021 B	XYLENE (TOTAL)	PA	EPA 8021 B - EXTENDED	METHYL TERT-BUTYL ETHER (MTBE)	PA
EPA 8081 A	4,4'-DDD	PA	EPA 8081 A	4,4'-DDE	PA
EPA 8081 A	4,4'-DDT	PA	EPA 8081 A	ALDRIN	PA

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EPA 8081 A	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA
EPA 8081 A	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	CHLORDANE (TECH.)	PA
EPA 8081 A	DELTA-BHC	PA	EPA 8081 A	DIELDRIN	PA
EPA 8081 A	ENDOSULFAN I	PA	EPA 8081 A	ENDOSULFAN II	PA
EPA 8081 A	ENDOSULFAN SULFATE	PA	EPA 8081 A	ENDRIN	PA
EPA 8081 A	ENDRIN ALDEHYDE	PA	EPA 8081 A	ENDRIN KETONE	PA
EPA 8081 A	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 A	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA
EPA 8081 A	HEPTACHLOR	PA	EPA 8081 A	HEPTACHLOR EPOXIDE	PA
EPA 8081 A	METHOXYCHLOR	PA	EPA 8081 A	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 8081 B	4,4'-DDD	PA	EPA 8081 B	4,4'-DDE	PA
EPA 8081 B	4,4'-DDT	PA	EPA 8081 B	ALDRIN	PA
EPA 8081 B	ALPHA-BHC (ALPHA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 B	ALPHA-CHLORDANE [CIS-CHLORDANE]	PA
EPA 8081 B	BETA-BHC (BETA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 B	CHLORDANE (TECH.)	PA
EPA 8081 B	DELTA-BHC	PA	EPA 8081 B	DIELDRIN	PA
EPA 8081 B	ENDOSULFAN I	PA	EPA 8081 B	ENDOSULFAN II	PA
EPA 8081 B	ENDOSULFAN SULFATE	PA	EPA 8081 B	ENDRIN	PA
EPA 8081 B	ENDRIN ALDEHYDE	PA	EPA 8081 B	ENDRIN KETONE	PA
EPA 8081 B	GAMMA-BHC (LINDANE, GAMMA-HEXACHLOROCYCLOHEXANE)	PA	EPA 8081 B	GAMMA-CHLORDANE [BETA-CHLORDANE, TRANS-CHLORDANE]	PA
EPA 8081 B	HEPTACHLOR	PA	EPA 8081 B	HEPTACHLOR EPOXIDE	PA
EPA 8081 B	METHOXYCHLOR	PA	EPA 8081 B	TOXAPHENE (CHLORINATED CAMPHENE)	PA
EPA 8081 B - EXTENDED	KEPONE	PA	EPA 8081 B - EXTENDED	MIREX	PA
EPA 8082 - OIL A	AROCLOR-1016 (PCB-1016)	PA	EPA 8082 - OIL A	AROCLOR-1221 (PCB-1221)	PA
EPA 8082 - OIL A	AROCLOR-1232 (PCB-1232)	PA	EPA 8082 - OIL A	AROCLOR-1242 (PCB-1242)	PA
EPA 8082 - OIL A	AROCLOR-1248 (PCB-1248)	PA	EPA 8082 - OIL A	AROCLOR-1254 (PCB-1254)	PA
EPA 8082 - OIL A	AROCLOR-1260 (PCB-1260)	PA	EPA 8082 A	AROCLOR-1016 (PCB-1016)	PA
EPA 8082 A	AROCLOR-1221 (PCB-1221)	PA	EPA 8082 A	AROCLOR-1232 (PCB-1232)	PA
EPA 8082 A	AROCLOR-1242 (PCB-1242)	PA	EPA 8082 A	AROCLOR-1248 (PCB-1248)	PA
EPA 8082 A	AROCLOR-1254 (PCB-1254)	PA	EPA 8082 A	AROCLOR-1260 (PCB-1260)	PA
EPA 8082 A - EXTENDED	AROCLOR-1262 (PCB-1262)	PA	EPA 8082 A - EXTENDED	AROCLOR-1268 (PCB-1268)	PA
EPA 8141 A	ATRAZINE	PA	EPA 8141 A	BOLSTAR (SULPROFOS)	PA

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EPA 8141 A	CHLORPYRIFOS	PA	EPA 8141 A	COUMAPHOS	PA
EPA 8141 A	DEMETON-O	PA	EPA 8141 A	DEMETON-S	PA
EPA 8141 A	DIAZINON	PA	EPA 8141 A	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 A	DISULFOTON	PA	EPA 8141 A	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA
EPA 8141 A	ETHION	PA	EPA 8141 A	ETHOPROP	PA
EPA 8141 A	FAMPHUR	PA	EPA 8141 A	FENSULFOTHION	PA
EPA 8141 A	FENTHION	PA	EPA 8141 A	MALATHION	PA
EPA 8141 A	MERPHOS	PA	EPA 8141 A	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8141 A	MEVINPHOS	PA	EPA 8141 A	NALED	PA
EPA 8141 A	PARATHION (PARATHION - ETHYL)	PA	EPA 8141 A	PHORATE	PA
EPA 8141 A	RONNEL	PA	EPA 8141 A	SIMAZINE	PA
EPA 8141 A	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA	EPA 8141 A	TOKUTHION (PROTHIOPHOS)	PA
EPA 8141 A	TRICHLORONATE	PA	EPA 8141 B	ATRAZINE	PA
EPA 8141 B	BOLSTAR (SULPROFOS)	PA	EPA 8141 B	COUMAPHOS	PA
EPA 8141 B	DEMETON-O	PA	EPA 8141 B	DEMETON-S	PA
EPA 8141 B	DIAZINON	PA	EPA 8141 B	DICHLOROVOS (DDVP, DICHLORVOS)	PA
EPA 8141 B	DISULFOTON	PA	EPA 8141 B	EPN (PHOSPHONOTHIOIC ACID, PHENYL-, O-ETHYL O-(P-NITROPHENYL) ESTER)	PA
EPA 8141 B	ETHION	PA	EPA 8141 B	ETHOPROP	PA
EPA 8141 B	FAMPHUR	PA	EPA 8141 B	FENSULFOTHION	PA
EPA 8141 B	FENTHION	PA	EPA 8141 B	MALATHION	PA
EPA 8141 B	MERPHOS	PA	EPA 8141 B	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8141 B	MEVINPHOS	PA	EPA 8141 B	NALED	PA
EPA 8141 B	PARATHION (PARATHION - ETHYL)	PA	EPA 8141 B	PHORATE	PA
EPA 8141 B	RONNEL	PA	EPA 8141 B	SIMAZINE	PA
EPA 8141 B	TETRACHLORVINPHOS (STIROPHOS, GARDONA) Z-ISOMER	PA	EPA 8141 B	TOKUTHION (PROTHIOPHOS)	PA
EPA 8141 B	TRICHLORONATE	PA	EPA 8151 A	2,4,5-T	PA
EPA 8151 A	2,4-D	PA	EPA 8151 A	2,4-DB	PA
EPA 8151 A	DALAPON	PA	EPA 8151 A	DICAMBA	PA
EPA 8151 A	DICHLOROPROP (DICHLORPROP)	PA	EPA 8151 A	DINOSEB (2-SEC-BUTYL-4,6-DINITROPHENOL, DNBP)	PA
EPA 8151 A	MCPA	PA	EPA 8151 A	MCPP	PA
EPA 8151 A	PENTACHLOROPHENOL	PA	EPA 8151 A	PICLORAM	PA
EPA 8151 A	SILVEX (2,4,5-TP)	PA	EPA 8260 B	1,1,1,2-TETRACHLOROETHANE	PA

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EPA 8260 B	1,1,1-TRICHLOROETHANE	PA	EPA 8260 B	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 B	1,1,2-TRICHLOROETHANE	PA	EPA 8260 B	1,1-DICHLOROETHANE	PA
EPA 8260 B	1,1-DICHLOROETHYLENE	PA	EPA 8260 B	1,1-DICHLOROPROPENE	PA
EPA 8260 B	1,2,3-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 B	1,2,4-TRICHLOROBENZENE	PA	EPA 8260 B	1,2,4-TRIMETHYLBENZENE	PA
EPA 8260 B	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA	EPA 8260 B	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 B	1,2-DICHLOROBENZENE	PA	EPA 8260 B	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 B	1,2-DICHLOROPROPANE	PA	EPA 8260 B	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 B	1,3-DICHLOROBENZENE	PA	EPA 8260 B	1,3-DICHLOROPROPANE	PA
EPA 8260 B	1,4-DICHLOROBENZENE	PA	EPA 8260 B	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 B	1-BUTANOL (N-BUTANOL)	PA	EPA 8260 B	2,2-DICHLOROPROPANE	PA
EPA 8260 B	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA	EPA 8260 B	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 B	2-CHLOROTOLUENE	PA	EPA 8260 B	2-HEXANONE	PA
EPA 8260 B	4-CHLOROTOLUENE	PA	EPA 8260 B	4-ISOPROPYLTOLUENE (P-CYMENE)	PA
EPA 8260 B	4-METHYL-2-PENTANONE (MIBK)	PA	EPA 8260 B	ACETONE	PA
EPA 8260 B	ACETONITRILE	PA	EPA 8260 B	ACROLEIN (PROPENAL)	PA
EPA 8260 B	ACRYLONITRILE	PA	EPA 8260 B	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA
EPA 8260 B	BENZENE	PA	EPA 8260 B	BENZYL CHLORIDE	PA
EPA 8260 B	BROMOBENZENE	PA	EPA 8260 B	BROMOCHLOROMETHANE	PA
EPA 8260 B	BROMODICHLOROMETHANE	PA	EPA 8260 B	BROMOFORM	PA
EPA 8260 B	CARBON DISULFIDE	PA	EPA 8260 B	CARBON TETRACHLORIDE	PA
EPA 8260 B	CHLOROBENZENE	PA	EPA 8260 B	CHLORODIBROMOMETHANE	PA
EPA 8260 B	CHLOROETHANE (ETHYL CHLORIDE)	PA	EPA 8260 B	CHLOROFORM	PA
EPA 8260 B	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA	EPA 8260 B	CIS-1,2-DICHLOROETHYLENE	PA
EPA 8260 B	CIS-1,3-DICHLOROPROPENE	PA	EPA 8260 B	DIBROMOMETHANE (METHYLENE BROMIDE)	PA
EPA 8260 B	DICHLORODIFLUOROMETHANE (FREON-12)	PA	EPA 8260 B	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA
EPA 8260 B	ETHANOL	PA	EPA 8260 B	ETHYL ACETATE	PA
EPA 8260 B	ETHYL METHACRYLATE	PA	EPA 8260 B	ETHYLBENZENE	PA
EPA 8260 B	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8260 B	IODOMETHANE (METHYL IODIDE)	PA
EPA 8260 B	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA	EPA 8260 B	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA
EPA 8260 B	ISOPROPYLBENZENE	PA	EPA 8260 B	M+P-XYLENE	PA
EPA 8260 B	METHACRYLONITRILE	PA	EPA 8260 B	METHYL BROMIDE (BROMOMETHANE)	PA

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EPA 8260 B	METHYL CHLORIDE (CHLOROMETHANE)	PA
EPA 8260 B	METHYL TERT-BUTYL ETHER (MTBE)	PA
EPA 8260 B	N-BUTYLBENZENE	PA
EPA 8260 B	NAPHTHALENE	PA
EPA 8260 B	PENTACHLOROETHANE	PA
EPA 8260 B	SEC-BUTYLBENZENE	PA
EPA 8260 B	TERT-BUTYL ALCOHOL	PA
EPA 8260 B	TETRACHLOROETHENE (PERCHLOROETHENE)	PA
EPA 8260 B	TRANS-1,2-DICHLOROETHENE	PA
EPA 8260 B	TRANS-1,4-DICHLORO-2-BUTENE	PA
EPA 8260 B	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA
EPA 8260 B	VINYL CHLORIDE	PA
EPA 8260 B - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	PA
EPA 8260 B - EXTENDED	CYCLOHEXANONE	PA
EPA 8260 B - EXTENDED	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 B - EXTENDED	METHYL ACETATE	PA
EPA 8260 B - EXTENDED	T-AMYL ALCOHOL (TAA)	PA
EPA 8260 B - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8260 C	1,1,1-TRICHLOROETHANE	PA
EPA 8260 C	1,1,2-TRICHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROETHYLENE	PA
EPA 8260 C	1,2,3-TRICHLOROBENZENE	PA
EPA 8260 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8260 C	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	PA
EPA 8260 C	1,2-DICHLOROBENZENE	PA
EPA 8260 C	1,2-DICHLOROPROPANE	PA
EPA 8260 C	1,3-DICHLOROBENZENE	PA
EPA 8260 C	1,4-DICHLOROBENZENE	PA
EPA 8260 C	2,2-DICHLOROPROPANE	PA
EPA 8260 C	2-CHLOROETHYL VINYL ETHER	PA
EPA 8260 C	2-HEXANONE	PA
EPA 8260 B	METHYL METHACRYLATE	PA
EPA 8260 B	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA
EPA 8260 B	N-PROPYLBENZENE	PA
EPA 8260 B	O-XYLENE	PA
EPA 8260 B	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 B	STYRENE	PA
EPA 8260 B	TERT-BUTYLBENZENE	PA
EPA 8260 B	TOLUENE	PA
EPA 8260 B	TRANS-1,3-DICHLOROPROPENE	PA
EPA 8260 B	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA
EPA 8260 B	VINYL ACETATE	PA
EPA 8260 B	XYLENE (TOTAL)	PA
EPA 8260 B - EXTENDED	CYCLOHEXANE	PA
EPA 8260 B - EXTENDED	DIISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 8260 B - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA
EPA 8260 B - EXTENDED	METHYLCYCLOHEXANE	PA
EPA 8260 B - EXTENDED	T-AMYLMETHYLETHER (TAME)	PA
EPA 8260 C	1,1,1,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1,2,2-TETRACHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROETHANE	PA
EPA 8260 C	1,1-DICHLOROPROPENE	PA
EPA 8260 C	1,2,3-TRICHLOROPROPANE	PA
EPA 8260 C	1,2,4-TRIMETHYLBENZENE	PA
EPA 8260 C	1,2-DIBROMOETHANE (EDB, ETHYLENE DIBROMIDE)	PA
EPA 8260 C	1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	PA
EPA 8260 C	1,3,5-TRIMETHYLBENZENE	PA
EPA 8260 C	1,3-DICHLOROPROPANE	PA
EPA 8260 C	1,4-DIOXANE (1,4-DIETHYLENEOXIDE)	PA
EPA 8260 C	2-BUTANONE (METHYL ETHYL KETONE, MEK)	PA
EPA 8260 C	2-CHLOROTOLUENE	PA
EPA 8260 C	4-CHLOROTOLUENE	PA

VELAP Certificate No.: 7815

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 C	4-ISOPROPYLTOLUENE (P-CYMENE)	PA	EPA 8260 C	4-METHYL-2-PENTANONE (MIBK)	PA
EPA 8260 C	ACETONE	PA	EPA 8260 C	ACETONITRILE	PA
EPA 8260 C	ACROLEIN (PROPENAL)	PA	EPA 8260 C	ACRYLONITRILE	PA
EPA 8260 C	ALLYL CHLORIDE (3-CHLOROPROPENE)	PA	EPA 8260 C	BENZENE	PA
EPA 8260 C	BENZYL CHLORIDE	PA	EPA 8260 C	BROMOBENZENE	PA
EPA 8260 C	BROMOCHLOROMETHANE	PA	EPA 8260 C	BROMODICHLOROMETHANE	PA
EPA 8260 C	BROMOFORM	PA	EPA 8260 C	CARBON DISULFIDE	PA
EPA 8260 C	CARBON TETRACHLORIDE	PA	EPA 8260 C	CHLOROBENZENE	PA
EPA 8260 C	CHLORODIBROMOMETHANE	PA	EPA 8260 C	CHLOROETHANE (ETHYL CHLORIDE)	PA
EPA 8260 C	CHLOROFORM	PA	EPA 8260 C	CHLOROPRENE (2-CHLORO-1,3-BUTADIENE)	PA
EPA 8260 C	CIS-1,2-DICHLOROETHYLENE	PA	EPA 8260 C	CIS-1,3-DICHLOROPROPENE	PA
EPA 8260 C	CYCLOHEXANE	PA	EPA 8260 C	DIBROMOMETHANE (METHYLENE BROMIDE)	PA
EPA 8260 C	DICHLORODIFLUOROMETHANE (FREON-12)	PA	EPA 8260 C	EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	PA
EPA 8260 C	ETHANOL	PA	EPA 8260 C	ETHYL ACETATE	PA
EPA 8260 C	ETHYL METHACRYLATE	PA	EPA 8260 C	ETHYL-T-BUTYLETHER (2-ETHOXY-2-METHYLPROPANE, ETBE)	PA
EPA 8260 C	ETHYLBENZENE	PA	EPA 8260 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8260 C	IODOMETHANE (METHYL IODIDE)	PA	EPA 8260 C	ISOBUTYL ALCOHOL (2-METHYL-1-PROPANOL)	PA
EPA 8260 C	ISOPROPYL ALCOHOL (2-PROPANOL, ISOPROPANOL)	PA	EPA 8260 C	ISOPROPYLBENZENE	PA
EPA 8260 C	METHACRYLONITRILE	PA	EPA 8260 C	METHYL BROMIDE (BROMOMETHANE)	PA
EPA 8260 C	METHYL CHLORIDE (CHLOROMETHANE)	PA	EPA 8260 C	METHYL METHACRYLATE	PA
EPA 8260 C	METHYL TERT-BUTYL ETHER (MTBE)	PA	EPA 8260 C	METHYLCYCLOHEXANE	PA
EPA 8260 C	METHYLENE CHLORIDE (DICHLOROMETHANE)	PA	EPA 8260 C	N-BUTYLBENZENE	PA
EPA 8260 C	N-PROPYLBENZENE	PA	EPA 8260 C	NAPHTHALENE	PA
EPA 8260 C	PENTACHLOROETHANE	PA	EPA 8260 C	PROPIONITRILE (ETHYL CYANIDE)	PA
EPA 8260 C	SEC-BUTYLBENZENE	PA	EPA 8260 C	STYRENE	PA
EPA 8260 C	T-AMYLMETHYLETHER (TAME)	PA	EPA 8260 C	TERT-BUTYL ALCOHOL	PA
EPA 8260 C	TETRACHLOROETHENE (PERCHLOROETHENE)	PA	EPA 8260 C	TOLUENE	PA
EPA 8260 C	TRANS-1,2-DICHLOROETHENE	PA	EPA 8260 C	TRANS-1,3-DICHLOROPROPENE	PA
EPA 8260 C	TRANS-1,4-DICHLORO-2-BUTENE	PA	EPA 8260 C	TRICHLOROETHENE (TRICHLOROETHYLENE)	PA

Scope of Accreditation

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8260 C	TRICHLOROFLUOROMETHANE (FLUOROTRICHLOROMETHANE, FREON 11)	PA	EPA 8260 C	VINYL ACETATE	PA
EPA 8260 C	VINYL CHLORIDE	PA	EPA 8260 C	XYLENE (TOTAL)	PA
EPA 8260 C - EXTENDED	1,1,2-TRICHLORO-1,2,2-TRIFLUORO ETHANE (FREON 113)	PA	EPA 8260 C - EXTENDED	DIISOPROPYLETHER (DIPE, ISOPROPYL ETHER)	PA
EPA 8260 C - EXTENDED	GASOLINE RANGE ORGANICS (GRO)	PA	EPA 8260 C - EXTENDED	METHYL ACETATE	PA
EPA 8260 C - EXTENDED	T-AMYL ALCOHOL (TAA)	PA	EPA 8260 C - EXTENDED	TETRAHYDROFURAN (THF)	PA
EPA 8270 C	1,2,4,5-TETRACHLOROBENZENE	PA	EPA 8270 C	1,2,4-TRICHLOROBENZENE	PA
EPA 8270 C	1,2-DICHLOROBENZENE	PA	EPA 8270 C	1,2-DINITROBENZENE	PA
EPA 8270 C	1,2-DIPHENYLHYDRAZINE	PA	EPA 8270 C	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA
EPA 8270 C	1,3-DICHLOROBENZENE	PA	EPA 8270 C	1,3-DINITROBENZENE (1,3-DNB)	PA
EPA 8270 C	1,4-DICHLOROBENZENE	PA	EPA 8270 C	1,4-DINITROBENZENE	PA
EPA 8270 C	1,4-NAPHTHOQUINONE	PA	EPA 8270 C	1,4-PHENYLENEDIAMINE	PA
EPA 8270 C	1-CHLORONAPHTHALENE	PA	EPA 8270 C	1-NAPHTHYLAMINE	PA
EPA 8270 C	2,3,4,6-TETRACHLOROPHENOL	PA	EPA 8270 C	2,4,5-TRICHLOROPHENOL	PA
EPA 8270 C	2,4,6-TRICHLOROPHENOL	PA	EPA 8270 C	2,4-DICHLOROPHENOL	PA
EPA 8270 C	2,4-DIMETHYLPHENOL	PA	EPA 8270 C	2,4-DINITROPHENOL	PA
EPA 8270 C	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8270 C	2,6-DICHLOROPHENOL	PA
EPA 8270 C	2,6-DINITROTOLUENE (2,6-DNT)	PA	EPA 8270 C	2-ACETYLAMINOFLUORENE	PA
EPA 8270 C	2-CHLORONAPHTHALENE	PA	EPA 8270 C	2-CHLOROPHENOL	PA
EPA 8270 C	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA	EPA 8270 C	2-METHYLNAPHTHALENE	PA
EPA 8270 C	2-METHYLPHENOL (O-CRESOL)	PA	EPA 8270 C	2-NAPHTHYLAMINE	PA
EPA 8270 C	2-NITROANILINE	PA	EPA 8270 C	2-NITROPHENOL	PA
EPA 8270 C	2-PICOLINE (2-METHYLPYRIDINE)	PA	EPA 8270 C	3,3'-DICHLOROBENZIDINE	PA
EPA 8270 C	3,3'-DIMETHOXYBENZIDINE	PA	EPA 8270 C	3,3'-DIMETHYLBENZIDINE	PA
EPA 8270 C	3-METHYLCHOLANTHRENE	PA	EPA 8270 C	3-METHYLPHENOL (M-CRESOL)	PA
EPA 8270 C	3-NITROANILINE	PA	EPA 8270 C	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA
EPA 8270 C	4-AMINOBIPHENYL	PA	EPA 8270 C	4-BROMOPHENYL PHENYL ETHER	PA
EPA 8270 C	4-CHLORO-3-METHYLPHENOL	PA	EPA 8270 C	4-CHLOROANILINE	PA
EPA 8270 C	4-CHLOROPHENYL PHENYLETHER	PA	EPA 8270 C	4-DIMETHYL AMINOAZOBENZENE	PA
EPA 8270 C	4-METHYLPHENOL (P-CRESOL)	PA	EPA 8270 C	4-NITROANILINE	PA
EPA 8270 C	4-NITROPHENOL	PA	EPA 8270 C	4-NITROQUINOLINE-1-OXIDE	PA
EPA 8270 C	5-NITRO-O-TOLUIDINE	PA	EPA 8270 C	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA
EPA 8270 C	A-A-DIMETHYLPHENETHYLAMINE	PA	EPA 8270 C	ACENAPHTHENE	PA
EPA 8270 C	ACENAPHTHYLENE	PA	EPA 8270 C	ACETOPHENONE	PA
EPA 8270 C	ANILINE	PA	EPA 8270 C	ANTHRACENE	PA

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 C	ARAMITE	PA	EPA 8270 C	BENZIDINE	PA
EPA 8270 C	BENZO(A)ANTHRACENE	PA	EPA 8270 C	BENZO(A)PYRENE	PA
EPA 8270 C	BENZO(B)FLUORANTHENE	PA	EPA 8270 C	BENZO(G,H,I)PERYLENE	PA
EPA 8270 C	BENZO(K)FLUORANTHENE	PA	EPA 8270 C	BENZOIC ACID	PA
EPA 8270 C	BENZYL ALCOHOL	PA	EPA 8270 C	BIS(2-CHLOROETHOXY)METHANE	PA
EPA 8270 C	BIS(2-CHLOROETHYL) ETHER	PA	EPA 8270 C	BIS(2-CHLOROISOPROPYL) ETHER	PA
EPA 8270 C	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA	EPA 8270 C	BUTYL BENZYL PHTHALATE	PA
EPA 8270 C	CHLOROBENZILATE	PA	EPA 8270 C	CHRYSENE	PA
EPA 8270 C	DI-N-BUTYL PHTHALATE	PA	EPA 8270 C	DI-N-OCTYL PHTHALATE	PA
EPA 8270 C	DIALLATE	PA	EPA 8270 C	DIBENZ(A, J) ACRIDINE	PA
EPA 8270 C	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 C	DIBENZOFURAN	PA
EPA 8270 C	DIETHYL PHTHALATE	PA	EPA 8270 C	DIMETHOATE	PA
EPA 8270 C	DIMETHYL PHTHALATE	PA	EPA 8270 C	DIPHENYLAMINE	PA
EPA 8270 C	DISULFOTON	PA	EPA 8270 C	ETHYL METHANESULFONATE	PA
EPA 8270 C	FAMPHUR	PA	EPA 8270 C	FLUORANTHENE	PA
EPA 8270 C	FLUORENE	PA	EPA 8270 C	HEXACHLOROBENZENE	PA
EPA 8270 C	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA	EPA 8270 C	HEXACHLOROCYCLOPENTADIENE	PA
EPA 8270 C	HEXACHLOROETHANE	PA	EPA 8270 C	HEXACHLOROPROPENE	PA
EPA 8270 C	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C	ISODRIN	PA
EPA 8270 C	ISOPHORONE	PA	EPA 8270 C	ISOSAFROLE	PA
EPA 8270 C	KEPONE	PA	EPA 8270 C	METHAPYRILENE	PA
EPA 8270 C	METHYL METHANESULFONATE	PA	EPA 8270 C	METHYL PARATHION (PARATHION, METHYL)	PA
EPA 8270 C	N-NITROSO-DI-N-BUTYLAMINE	PA	EPA 8270 C	N-NITROSODI-N-PROPYLAMINE	PA
EPA 8270 C	N-NITROSODIETHYLAMINE	PA	EPA 8270 C	N-NITROSODIMETHYLAMINE	PA
EPA 8270 C	N-NITROSODIPHENYLAMINE	PA	EPA 8270 C	N-NITROSOMETHYLETHYLAMINE	PA
EPA 8270 C	N-NITROSOMORPHOLINE	PA	EPA 8270 C	N-NITROSOPIPERIDINE	PA
EPA 8270 C	N-NITROSOPYRROLIDINE	PA	EPA 8270 C	NAPHTHALENE	PA
EPA 8270 C	NITROBENZENE	PA	EPA 8270 C	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA
EPA 8270 C	O-TOLUIDINE (2-METHYLANILINE)	PA	EPA 8270 C	PARATHION (PARATHION - ETHYL)	PA
EPA 8270 C	PENTACHLOROBENZENE	PA	EPA 8270 C	PENTACHLORONITROBENZENE	PA
EPA 8270 C	PENTACHLOROPHENOL	PA	EPA 8270 C	PHENACETIN	PA
EPA 8270 C	PHENANTHRENE	PA	EPA 8270 C	PHENOL	PA
EPA 8270 C	PHORATE	PA	EPA 8270 C	PHTHALIC ANHYDRIDE	PA
EPA 8270 C	PRONAMIDE (KERB)	PA	EPA 8270 C	PYRENE	PA
EPA 8270 C	PYRIDINE	PA	EPA 8270 C	SAFROLE	PA
EPA 8270 C	THIONAZIN (ZINOPHOS)	PA	EPA 8270 C	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
			EPA 8270 C SIM	2-METHYLNAPHTHALENE	PA
EPA 8270 C SIM	ACENAPHTHENE	PA	EPA 8270 C SIM	ACENAPHTHYLENE	PA
EPA 8270 C SIM	ANTHRACENE	PA	EPA 8270 C SIM	BENZO(A)ANTHRACENE	PA
EPA 8270 C SIM	BENZO(A)PYRENE	PA	EPA 8270 C SIM	BENZO(B)FLUORANTHENE	PA
EPA 8270 C SIM	BENZO(G,H,I)PERYLENE	PA	EPA 8270 C SIM	BENZO(K)FLUORANTHENE	PA
EPA 8270 C SIM	CHRYSENE	PA	EPA 8270 C SIM	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 C SIM	FLUORANTHENE	PA	EPA 8270 C SIM	FLUORENE	PA
EPA 8270 C SIM	INDENO(1,2,3-CD) PYRENE	PA	EPA 8270 C SIM	NAPHTHALENE	PA
EPA 8270 C SIM	PHENANTHRENE	PA	EPA 8270 C SIM	PYRENE	PA
EPA 8270 C SIM - EXTENDED	1-METHYLNAPHTHALENE	PA	EPA 8270 D	1,2,4,5-TETRACHLOROBENZENE	PA
EPA 8270 D	1,2,4-TRICHLOROBENZENE	PA	EPA 8270 D	1,2-DICHLOROBENZENE	PA
EPA 8270 D	1,2-DINITROBENZENE	PA	EPA 8270 D	1,2-DIPHENYLHYDRAZINE	PA
EPA 8270 D	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA	EPA 8270 D	1,3-DICHLOROBENZENE	PA
EPA 8270 D	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8270 D	1,4-DICHLOROBENZENE	PA
EPA 8270 D	1,4-DINITROBENZENE	PA	EPA 8270 D	1,4-NAPHTHOQUINONE	PA
EPA 8270 D	1,4-PHENYLENEDIAMINE	PA	EPA 8270 D	1-CHLORONAPHTHALENE	PA
EPA 8270 D	1-NAPHTHYLAMINE	PA	EPA 8270 D	2,3,4,6-TETRACHLOROPHENOL	PA
EPA 8270 D	2,4,5-TRICHLOROPHENOL	PA	EPA 8270 D	2,4,6-TRICHLOROPHENOL	PA
EPA 8270 D	2,4-DICHLOROPHENOL	PA	EPA 8270 D	2,4-DIMETHYLPHENOL	PA
EPA 8270 D	2,4-DINITROPHENOL	PA	EPA 8270 D	2,4-DINITROTOLUENE (2,4-DNT)	PA
EPA 8270 D	2,6-DICHLOROPHENOL	PA	EPA 8270 D	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8270 D	2-ACETYLAMINOFLUORENE	PA	EPA 8270 D	2-CHLORONAPHTHALENE	PA
EPA 8270 D	2-CHLOROPHENOL	PA	EPA 8270 D	2-METHYL-4,6-DINITROPHENOL (4,6-DINITRO-2-METHYLPHENOL)	PA
EPA 8270 D	2-METHYLNAPHTHALENE	PA	EPA 8270 D	2-METHYLPHENOL (O-CRESOL)	PA
EPA 8270 D	2-NAPHTHYLAMINE	PA	EPA 8270 D	2-NITROANILINE	PA
EPA 8270 D	2-NITROPHENOL	PA	EPA 8270 D	2-PICOLINE (2-METHYLPYRIDINE)	PA
EPA 8270 D	3,3'-DICHLOROBENZIDINE	PA	EPA 8270 D	3,3'-DIMETHOXYBENZIDINE	PA
EPA 8270 D	3,3'-DIMETHYLBENZIDINE	PA	EPA 8270 D	3-METHYLCHOLANTHRENE	PA
EPA 8270 D	3-METHYLPHENOL (M-CRESOL)	PA	EPA 8270 D	3-NITROANILINE	PA
EPA 8270 D	4,4'-METHYLENEBIS(2-CHLOROANILINE)	PA	EPA 8270 D	4-AMINOBIPHENYL	PA
EPA 8270 D	4-BROMOPHENYL PHENYL ETHER	PA	EPA 8270 D	4-CHLORO-3-METHYLPHENOL	PA
EPA 8270 D	4-CHLOROANILINE	PA	EPA 8270 D	4-CHLOROPHENYL PHENYLETHER	PA
EPA 8270 D	4-DIMETHYL AMINOAZOBENZENE	PA	EPA 8270 D	4-METHYLPHENOL (P-CRESOL)	PA
EPA 8270 D	4-NITROANILINE	PA	EPA 8270 D	4-NITROPHENOL	PA
EPA 8270 D	4-NITROQUINOLINE-1-OXIDE	PA	EPA 8270 D	5-NITRO-O-TOLUIDINE	PA
EPA 8270 D	7,12-DIMETHYLBENZ(A) ANTHRACENE	PA	EPA 8270 D	A-A-DIMETHYLPHENETHYLAMINE	PA

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	ACENAPHTHENE	PA	EPA 8270 D	ACENAPHTHYLENE	PA
EPA 8270 D	ACETOPHENONE	PA	EPA 8270 D	ANILINE	PA
EPA 8270 D	ANTHRACENE	PA	EPA 8270 D	ARAMITE	PA
EPA 8270 D	BENZIDINE	PA	EPA 8270 D	BENZO(A)ANTHRACENE	PA
EPA 8270 D	BENZO(A)PYRENE	PA	EPA 8270 D	BENZO(B)FLUORANTHENE	PA
EPA 8270 D	BENZO(G,H,I)PERYLENE	PA	EPA 8270 D	BENZO(K)FLUORANTHENE	PA
EPA 8270 D	BENZOIC ACID	PA	EPA 8270 D	BENZYL ALCOHOL	PA
EPA 8270 D	BIS(2-CHLOROETHOXY)METHANE	PA	EPA 8270 D	BIS(2-CHLOROETHYL) ETHER	PA
EPA 8270 D	BIS(2-CHLOROISOPROPYL) ETHER	PA	EPA 8270 D	BIS(2-ETHYLHEXYL) PHTHALATE (DI(2-ETHYLHEXYL)PHTHALATE), (DEHP)	PA
EPA 8270 D	BUTYL BENZYL PHTHALATE	PA	EPA 8270 D	CHLOROBENZILATE	PA
EPA 8270 D	CHRYSENE	PA	EPA 8270 D	DI-N-BUTYL PHTHALATE	PA
EPA 8270 D	DI-N-OCTYL PHTHALATE	PA	EPA 8270 D	DIALLATE	PA
EPA 8270 D	DIBENZ(A, J) ACRIDINE	PA	EPA 8270 D	DIBENZO(A,H) ANTHRACENE	PA
EPA 8270 D	DIBENZOFURAN	PA	EPA 8270 D	DIETHYL PHTHALATE	PA
EPA 8270 D	DIMETHOATE	PA	EPA 8270 D	DIMETHYL PHTHALATE	PA
EPA 8270 D	DIPHENYLAMINE	PA	EPA 8270 D	DISULFOTON	PA
EPA 8270 D	ETHYL METHANESULFONATE	PA	EPA 8270 D	FAMPHUR	PA
EPA 8270 D	FLUORANTHENE	PA	EPA 8270 D	FLUORENE	PA
EPA 8270 D	HEXACHLOROBENZENE	PA	EPA 8270 D	HEXACHLOROBUTADIENE (1,3-HEXACHLOROBUTADIENE)	PA
EPA 8270 D	HEXACHLOROCYCLOPENTADIENE	PA	EPA 8270 D	HEXACHLOROETHANE	PA
EPA 8270 D	HEXACHLOROPROPENE	PA	EPA 8270 D	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 D	ISODRIN	PA	EPA 8270 D	ISOPHORONE	PA
EPA 8270 D	ISOSAFROLE	PA	EPA 8270 D	KEPONE	PA
EPA 8270 D	METHAPYRILENE	PA	EPA 8270 D	METHYL METHANESULFONATE	PA
EPA 8270 D	METHYL PARATHION (PARATHION, METHYL)	PA	EPA 8270 D	N-NITROSO-DI-N-BUTYLAMINE	PA
EPA 8270 D	N-NITROSODI-N-PROPYLAMINE	PA	EPA 8270 D	N-NITROSODIETHYLAMINE	PA
EPA 8270 D	N-NITROSODIMETHYLAMINE	PA	EPA 8270 D	N-NITROSODIPHENYLAMINE	PA
EPA 8270 D	N-NITROSOMETHYLETHYLAMINE	PA	EPA 8270 D	N-NITROSOMORPHOLINE	PA
EPA 8270 D	N-NITROSOPIPERIDINE	PA	EPA 8270 D	N-NITROSOPYRROLIDINE	PA
EPA 8270 D	NAPHTHALENE	PA	EPA 8270 D	NITROBENZENE	PA
EPA 8270 D	O,O,O-TRIETHYL PHOSPHOROTHIOATE	PA	EPA 8270 D	O-TOLUIDINE (2-METHYLANILINE)	PA
EPA 8270 D	PARATHION (PARATHION - ETHYL)	PA	EPA 8270 D	PENTACHLOROBENZENE	PA
EPA 8270 D	PENTACHLORONITROBENZENE	PA	EPA 8270 D	PENTACHLOROPHENOL	PA
EPA 8270 D	PHENACETIN	PA	EPA 8270 D	PHENANTHRENE	PA
EPA 8270 D	PHENOL	PA	EPA 8270 D	PHORATE	PA
EPA 8270 D	PHTHALIC ANHYDRIDE	PA	EPA 8270 D	PRONAMIDE (KERB)	PA

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SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8270 D	PYRENE	PA	EPA 8270 D	SAFROLE	PA
EPA 8270 D	THIONAZIN (ZINOPHOS)	PA	EPA 8270 D	TRIS-(2,3-DIBROMOPROPYL) PHOSPHATE (TRIS-BP)	PA
EPA 8270 D - EXTENDED	1,1'-BIPHENYL	PA	EPA 8270 D - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8270 D - EXTENDED	ATRAZINE	PA	EPA 8270 D - EXTENDED	BENZALDEHYDE	PA
EPA 8270 D - EXTENDED	BIS(2-ETHYLHEXYL)ADIPATE (DI(2-ETHYLHEXYL)ADIPATE)	PA	EPA 8270 D - EXTENDED	CAPROLACTAM	PA
EPA 8270 D - EXTENDED	CARBAZOLE	PA	EPA 8270 D - EXTENDED	PYRIDINE	PA
EPA 8270 D SIM	2-METHYLNAPHTHALENE	PA	EPA 8270 D SIM	ACENAPHTHENE	PA
EPA 8270 D SIM	ACENAPHTHYLENE	PA	EPA 8270 D SIM	ANTHRACENE	PA
EPA 8270 D SIM	BENZO(A)ANTHRACENE	PA	EPA 8270 D SIM	BENZO(A)PYRENE	PA
EPA 8270 D SIM	BENZO(B)FLUORANTHENE	PA	EPA 8270 D SIM	BENZO(G,H,I)PERYLENE	PA
EPA 8270 D SIM	BENZO(K)FLUORANTHENE	PA	EPA 8270 D SIM	CHRYSENE	PA
EPA 8270 D SIM	DIBENZO(A,H) ANTHRACENE	PA	EPA 8270 D SIM	FLUORANTHENE	PA
EPA 8270 D SIM	FLUORENE	PA	EPA 8270 D SIM	INDENO(1,2,3-CD) PYRENE	PA
EPA 8270 D SIM	NAPHTHALENE	PA	EPA 8270 D SIM	PHENANTHRENE	PA
EPA 8270 D SIM	PYRENE	PA	EPA 8270 D SIM - EXTENDED	1-METHYLNAPHTHALENE	PA
EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	PA
EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (1,2,3,4,6,7,8-HPCDD)	PA	EPA 8290 A	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (1,2,3,4,6,7,8-HPCDF)	PA
EPA 8290 A	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (1,2,3,4,7,8,9-HPCDF)	PA	EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,4,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (1,2,3,4,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN(1,2,3,6,7,8-HXCDD)	PA
EPA 8290 A	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (1,2,3,6,7,8-HXCDF)	PA	EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (1,2,3,7,8,9-HXCDD)	PA
EPA 8290 A	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (1,2,3,7,8,9-HXCDF)	PA	EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (1,2,3,7,8-PECDD)	PA
EPA 8290 A	1,2,3,7,8-PENTACHLORODIBENZOFURAN (1,2,3,7,8-PECDF)	PA	EPA 8290 A	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (2,3,4,6,7,8-HXCDF)	PA
EPA 8290 A	2,3,4,7,8-PENTACHLORODIBENZOFURAN	PA	EPA 8290 A	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (2,3,7,8-TCDD)	PA
EPA 8290 A	2,3,7,8-TETRACHLORODIBENZOFURAN (2,3,7,8-TCDF)	PA	EPA 8315 A	2,5-DIMETHYLBENZALDEHYDE	PA
EPA 8315 A	ACETALDEHYDE	PA	EPA 8315 A	BENZALDEHYDE	PA
EPA 8315 A	BUTYLALDEHYDE (BUTANAL)	PA	EPA 8315 A	CROTONALDEHYDE	PA
EPA 8315 A	FORMALDEHYDE	PA	EPA 8315 A	HEXANALDEHYDE (HEXANAL)	PA
EPA 8315 A	ISOVALERALDEHYDE	PA	EPA 8315 A	M-TOLUALDEHYDE (1,3-TOLUALDEHYDE)	PA
EPA 8315 A	O-TOLUALDEHYDE (1,2-TOLUALDEHYDE)	PA	EPA 8315 A	P-TOLUALDEHYDE (1,4-TOLUALDEHYDE)	PA
EPA 8315 A	PENTANAL (VALERALDEHYDE)	PA	EPA 8315 A	PROPIONALDEHYDE (PROPANAL)	PA
EPA 8330	NITROGLYCERIN	PA	EPA 8330 A	1,3,5-TRINITROBENZENE (1,3,5-TNB)	PA

Commonwealth of Virginia

Department of General Services
Division of Consolidated Laboratory Services

Scope of Accreditation

VELAP Certificate No.: 7815

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601

Virginia Laboratory ID: 460182
Effective Date: June 15, 2015
Expiration Date: June 14, 2016

SOLID AND CHEMICAL MATERIALS

METHOD	ANALYTE	PRIMARY	METHOD	ANALYTE	PRIMARY
EPA 8330 A	1,3-DINITROBENZENE (1,3-DNB)	PA	EPA 8330 A	2,4,6-TRINITROTOLUENE (2,4,6-TNT)	PA
EPA 8330 A	2,4-DINITROTOLUENE (2,4-DNT)	PA	EPA 8330 A	2,6-DINITROTOLUENE (2,6-DNT)	PA
EPA 8330 A	2-AMINO-4,6-DINITROTOLUENE (2-AM-DNT)	PA	EPA 8330 A	2-NITROTOLUENE	PA
EPA 8330 A	3-NITROTOLUENE	PA	EPA 8330 A	4-AMINO-2,6-DINITROTOLUENE (4-AM-DNT)	PA
EPA 8330 A	4-NITROTOLUENE	PA	EPA 8330 A	METHYL-2,4,6-TRINITROPHENYLNITRAMINE (TETRYL)	PA
EPA 8330 A	NITROBENZENE	PA	EPA 8330 A	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	PA
EPA 8330 A	RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	PA	EPA 9012 A	CYANIDE	PA
EPA 9045 C	PH	PA	EPA 9045 D	PH	PA
EPA 9050 A	CONDUCTIVITY	PA	EPA 9060	TOTAL ORGANIC CARBON	PA
EPA 9066	TOTAL PHENOLICS	PA	EPA 9071 B	OIL AND GREASE (AS HEM)	PA
EPA 9081	CATION EXCHANGE CAPACITY	PA	EPA 9095 B	FREE LIQUID	PA

APPENDIX D

FIELD NOTES (CD-ROM)

4/20/15 RFAAP 803204-13 KFC/TDE F.B. #12

- Weather - Sunny 70°
- PPE - Hard hats, nitrile gloves, eye protectant steel toed boots
- Calibrations: YSI 650 MDS

pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
Conductivity reads 1413 µs in a 1413µs standard
DO% = 100 %
HACH 2100Q TURBIDIMETER = 0.02 - 1000 NTU

- Dedicated tubing & well skirts used at all wells
- All equipment decon'ed before & after event and between wells, as needed.
- All purge water collected and disposed of at dedicated location on-site.
- All samples collected, stored and transported on ice in coolers.

(UNIT-5)

STATIC WATER LEVEL TABLE (SAMPLED)

WELL	DTW	POST-PURGE DTW	NOTES
5W8B	13.36	14.11	
5W7B	7.69	7.71	
5W5B	6.73	7.05	
5WC21	7.04	7.06	
5WC22	6.98	7.06	
5WC23	6.35	6.38	
5W12A	9.47	9.52	

NON-SAMPLED WELL

WELL	DTW	WELL	DTW
35W7	10.40	5WCA	11.49
35W5	5.89	55W6	4.33
5W9A	0.90	55W8	10.87
5W10A	12.97	5WC11	14.26
5W11A	7.12	5WC12	~~14.86~~ 14.66

4/20/15

RFAAP
W0326-4-13
KFC/TBE

F.B.# 13

SW8B

DTW: 13.36 — Begin Purge (0942)

Post-purge DTW: 14.11 — Initial Purge: clear

TIME	Temp(°C)	Cond(ms)	DO mg/L	pH	ORP(mv)	TURB (NTU)	PURGE L/min	DESC
(0945)	13.70	78	7.78	5.36	158.9	2.73	<0.3 L/min	clear
(0950)	13.79	71	7.35	4.72	182.0	3.49	"	clear
(0955)	13.91	70	7.35	4.69	184.2	2.68	"	clear
(1000)	13.93	69	7.33	4.76	179.1	2.01	"	clear
(1005)	13.87	69	7.33	4.81	174.0	1.84	"	clear
(1010)	13.95	69	7.34	4.82	172.9	1.65	"	clear
(1015)	13.90	69	7.36	4.85	169.9	1.60	"	clear
(1015)	Readings Stable							
(1025)	14.01	69	7.38	4.93	164.4	2.20	Post Purge Reading	

Sample Time (1020)

Samples Collected: (3) 8260C, (1) TIC

SW5B

DTW: 6.73 — Begin Purge (1034)

Post Purge DTW: 7.05 — Initial Purge: clear

Time	Temp(°C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge	Desc
(1035)	12.24	423	7.83	5.35	144.6	4.44	<0.3 L/min	clear
(1040)	11.51	407	5.31	5.36	140.6	3.11	"	clear
(1045)	11.48	408	5.30	5.37	139.8	2.78	"	clear
(1050)	11.45	411	5.30	5.42	137.9	2.65	"	clear
(1055)	11.56	413	5.32	5.47	134.7	1.94	"	clear
(1100)	11.65	414	5.35	5.51	131.4	1.64	"	clear
(1105)	11.68	415	5.41	5.52	129.4	1.26	"	clear
(1105)	Readings Stable							
(1121)	11.78	419	5.52	5.49	132.0	1.32	Post Purge Reading	

Sample Time (1110)

Samples Collected: (3) 8260C, (1) TIC, (4) 8270D

SWC21

DTW: 7.04 Begin Purge (1136)
Post Purge DTW: 7.06 Initial Purge: Sl. cloudy

Time	Temp(°C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	Turbidity(NTU)	Purge	Desc
(1140)	13.81	720	4.52	4.87	155.3	117	≤0.3 L/min	Sl. cloudy
(1145)	13.63	709	2.09	4.86	155.0	101	"	Sl. cloudy
(1150)	13.72	689	1.60	4.71	163.0	90.5	"	Sl. cloudy
(1155)	13.85	681	1.64	4.68	166.0	74.5	"	Sl. cloudy
(1200)	13.90	676	1.66	4.67	168.3	58.1	"	Sl. cloudy
(1205)	14.06	676	1.70	4.68	165.4	43.2	"	Sl. cloudy
(1210)	14.14	676	1.84	4.71	166.0	33.2	"	Sl. cloudy
(1215)	14.21	676	1.88	4.73	166.5	27.5	"	Clear
(1220)	14.25	677	1.87	4.74	163.9	26.2	"	Clear
(1220)	Readings Stable							
(1239)	14.22	677	1.79	5.04	142.4	14.3		Post Purge Readings

Sample Time (1225)
Samples Collected: (3) 8260C, (1) TM, (6) 8270D

SWDUP - Taken From SWC21

Sample Time (1230)
Samples Collected: (3) 8260C, (1) TM, (2) 8270D

SWC22

DTW: 6.98 Begin Purge (1245)
Post Purge DTW: 7.06 Initial Purge: Clear

Time	Temp(°C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	Turbidity(NTU)	Purge	Desc
(1250)	13.50	1001	1.62	6.48	102.4	48.2	≤0.3 L/min	Clear
(1255)	13.75	996	0.26	6.58	101.6	56.6	"	Sl. cloudy
(1300)	13.91	993	0.14	6.60	97.0	38.9	"	Sl. cloudy
(1305)	13.83	995	0.12	6.61	92.0	20.4	"	Clear
(1310)	13.90	995	0.11	6.61	86.1	12.7	"	Clear
(1315)	13.82	995	0.09	6.62	84.2	9.16	"	Clear

cont on Page 33

SWC 22 - con't

Time	Temp(C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge Rt	Desc
(1320)	13.79	994	0.09	6.62	84.6	7.05	≤0.3 L/min	clear
(1320)	Readings Stable						"	
(1335)	13.89	999	0.17	6.62	84.5	8.32	Post Purge Reading	

Sample Time (1325)
Samples Collected: (3) 8260C, (1) TM, (6) 8270D

SWC 23
DTW: 6.35
Post Purge DTW: 6.38
Begin Purge (1349)
Initial Purge: clear

Time	Temp(C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge Rt	Desc
(1350)	12.56	1064	7.63	7.01	78.2	64.7	≤0.3 L/min	Sl. cloudy
(1355)	12.74	1155	3.76	6.78	82.6	80.1	"	Sl. cloudy
(1400)	13.01	1166	2.75	6.74	80.4	87.2	"	Sl. cloudy
(1405)	13.14	1171	2.59	6.72	77.8	69.1	"	Sl. cloudy
(1410)	12.96	1171	2.55	6.72	77.6	51.9	"	Sl. cloudy
(1415)	12.88	1168	2.35	6.71	80.3	35.0	"	clear
(1420)	12.88	1168	2.34	6.71	81.2	30.9	"	clear
(1425)	12.75	1167	2.30	6.71	82.1	30.4	"	clear
(1425)	Readings Stable							
(1439)	12.89	1176	2.14	6.74	74.8	25.8	Post Purge Reading	

Sample Time (1430)
Samples Collected: (3) 8260C, (1) TM, (6) 8270D

General Notes
- Weather: Sunny 50s - 60s
- PPE: Eye Protection, Nitrile Gloves, Steel Toed Boots, Hard Hats
- Calibrations: YSI 650 MDS
  pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.99
  Conductivity reads 1413 µs in 1413 µs Std
  DO% = 100
  HACH 2100Q Turbidimeter: 0.02 - 1000 NTU
- Dedicated tubing & well skirts used at each well
- All equipment decon'ed before & after event and between use at each sampling location
- All purge water disposed of @ dedicated location on site
- All samples collected, stored and transported on ice in coolers
- All Volatiles samples collected @ 0.1 L/min.

SW7B

OTW: 7.69 — Begin Purge (0908)
Post Purge OTW: 7.71 — Initial Purge: clear

Time	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge Desc
(0910)	9.43	126	9.99	5.14	154.5	6.53	≤0.3 L/min clear
(0915)	9.60	157	9.72	5.07	155.0	4.01	" clear
(0920)	9.60	192	9.49	4.98	155.3	3.92	" clear
(0925)	9.65	137	9.29	4.54	167.3	2.19	" clear
(0930)	9.68	136	9.19	4.53	168.7	1.82	" clear
(0935)	9.81	138	9.18	4.54	170.5	1.76	" clear
(0940)	9.85	139	9.17	4.55	171.6	1.73	" clear
(0945)	9.90	139	9.13	4.56	172.5	1.23	" clear
(0945) Reading Stable							
(1009)	10.17	142	9.08	4.51	182.1	2.28	Post Purge Reading

Sample Time (0950)
Samples Collected: (9) 8260C, (3) TM
(10) 8270D

4/21/15 RFAAP FB#12
B03204-13
TCE/RFC

SW12A

DTW: 9.47 Begin Purge (1019)
Post Purge DTW: 9.52 Initial Purge: Clear

Time	Temp(C)	Cond(us)	DO(mg/L)	pH	ORP(mv)	Turb(NTU)	Purge%	Desc
(1020)	13.20	467	4.94	5.89	130.8	11.8	≤ 3%	Clear
(1025)	13.64	535	2.86	6.25	117.7	6.13	"	clear
(1030)	13.78	539	2.53	6.29	104.8	3.74	"	clear
(1035)	13.81	540	2.43	6.30	98.4	2.59	"	Clear
(1040)	13.91	541	2.30	6.31	92.0	2.23	"	Clear
(1045)	13.83	544	2.15	6.33	87.3	1.71	"	clear
(1050)	13.91	543	2.09	6.33	83.1	1.72	"	clear
(1050)	Readings Stable							
(1103)	14.01	544	1.84	6.40	74.7	1.67	Post Purge Readings	

Sample Time (1055)
Samples Collected: (3) 8260C, (1) TM1, (2) 8270D

APPROVED BY Ashley Thacker
DATE 12/11/2015

Static Water Level Table - Unit 16

Well	DTW	Post Purge DTW	Notes
16-1	48.53		SWL-only
16-2	55.88	55.97	
16-3	56.30	66.25	
16-5	3.65	12.83	
16WC2B	52.21	62.26	
16MW8	71.19	72.17	
16WC1B	63.98	64.49	
16WC1A	~~63.98~~ 64.04 TBE 4/21/15	66.75	
16MW9	61.64	62.65	
16C1	48.28	48.31	
16C3	63.70		SWL-only
16DDH3	DRY		"
16WC2A	DRY		"

10/19/15 RFAAP F.B. #12
BCB20X-13
KFC/umn

General Notes:

- Weather: 30's-40's Sunny
- PPE - Eye protection, nitrile gloves, steel toe boots, hard hats
- Calibrations: YSI 650 MPS

pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.99

Conductivity reads 1413 µs in a 1413 µs std (cmm 10-19-15)

DO% = ~~1413~~ ~~%~~ 100% HACH Turbidimeter 2100Q 0.02-1000 NTU

- Dedicated tubing & wellskirts used at all wells.
- All equipment decon'ed before and after event and between use at each sampling location.
- All purge water disposed of at dedicated location onsite.
- All samples collected, stored, and transported on ice in coolers
- All wells purged and sampled at 0.25 L/min
- Sample collection order: 8260C, TM
- 8260C preserved with HCL-CG
- TM preserved with HNO_3 - P
- VOAs collected from one pulse from bladder pump
- Bladder pump 4 cycles/min 5 sec discharge, 10 sec recharge

STATIC WATER LEVEL TABLE (UNITS)

WELL	DTW	Post Purge DTW	NOTES
5W8B	14.99	15.65	
5W7B	9.20	9.22	
5W5B	9.14	9.80	
5WC21	9.31	9.39	
5WC22	9.27	9.31	
5WC23	8.66	8.76	
5W12A	11.96	11.98	

WELL	DTW
S5W7	12.10
S5W5	8.28
5W9A	2.01
5W10A	13.91
5W11A	11.27

WELL	DTW	
5WCA	12.88	
S5W6	7.04	
S5W8	12.02	no well cap
5WC11	16.01	no well cap
5WC12	16.37	no well cap

10/19/15 RFAAP FB#12
BO3204-13
KFC/WMD

5W8B

DTW: 14.99 Begin Purge (0932)
Post Purge DTW: 15.65 Initial Purge: clear

TIME	TEMP(C)	COND(mS/cm)	DO(mg/L)	pH	ORP(mV)	Turb (NTU)	DTW	Desc.
(0935)	14.42	110	9.86	5.02	133.4	1.60	16.71	clear
(0940)	14.77	111	9.55	4.61	140.8	2.06	15.81	clear
(0945)	14.80	110	9.52	4.55	143.3	1.57	15.65	clear
(0950)	14.86	108	9.44	4.53	143.8	1.98	15.61	clear
(0955)	14.92	107	9.36	4.51	143.4	2.18	15.64	clear
(1000)	14.94	106	9.34	4.51	142.5	1.83	15.65	clear
(1000)	Readings Stable							
(1010)	14.72	105	9.37	4.51	143.6	2.68	15.65	clear

Sample Time (1005)
Samples Collected: (3) 8260C, (1) TM

5W12A

DTW: 11.96 Begin Purge (1022)
Post Purge DTW: 11.98 Initial Purge: clear

TIME	TEMP(C)	COND(mS/cm)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc
(1025)	14.06	613	4.39	6.13	80.4	5.70	11.99	clear
(1030)	14.18	623	3.16	6.40	62.4	10.1	11.99	clear
(1035)	14.13	627	2.43	6.35	54.4	6.81	12.00	clear
(1040)	14.06	627	2.14	6.36	47.3	7.08	11.99	clear
(1045)	14.11	626	1.98	6.38	35.4	4.74	11.98	clear
(1050)	14.24	627	2.02	6.40	16.6	7.38	11.98	clear
(1055)	14.29	627	1.98	6.42	3.7	5.76	11.98	clear
(1100)	14.29	626	1.92	6.41	7.8	4.55	11.99	clear
(1105)	14.26	626	1.94	6.43	-2.2	2.85	11.98	clear
(1105)	Readings Stable							
(1115)	14.49	628	2.04	6.45	-16.1	2.46	11.98	clear

Sample Time (1110)
Samples Collected: (3) 8260C, (1) TM

10/19/15 RFAAP B03204-13 WMD/KFC F.B. # 12

SW7B

DTW: 9.20 Begin Purge (1133)

Post Purge DTW: 9.22 Initial Purge: clear

TIME	TEMP(°C)	COND(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc
(1135)	18.90	198	9.56	5.91	73.0	1.31	9.19	clear
(1140)	19.10	191	4.74	4.43	122.4	0.77	9.21	"
(1145)	19.14	190	4.63	4.33	125.7	0.48	9.21	"
(1150)	19.09	191	4.63	4.26	130.6	0.75	9.26	"
(1155)	19.09	190	4.80	4.24	135.9	0.84	9.24	"
(1200)	19.06	190	5.05	4.22	138.5	0.60	9.25	"
(1200)	Readings Stable							
(1211)	18.96	193	5.45	4.19	137.5	1.15	9.22	"

Sample Time (1205)

Samples Collected: (9) 8260C, (3) TM

SW5B

DTW: 9.14 Begin Purge (1223)

Post Purge DTW: 9.80 Initial Purge: clear

TIME	TEMP(°C)	COND(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc
(1225)	15.63	485	6.48	5.05	116.9	1.04	9.60	clear
(1230)	15.82	471	5.41	5.08	110.5	0.74	9.61	"
(1235)	15.91	481	4.88	5.24	98.7	0.54	9.60	"
(1240)	15.91	479	5.39	5.15	103.0	0.55	9.61	"
(1245)	15.94	478	5.73	5.16	102.1	0.39	9.62	"
(1250)	15.93	479	5.85	5.17	101.3	0.41	9.61	"
(1250)	Readings Stable				~~101.2~~	~~0.54~~		SW WMD 10-19-15
(1300)	16.02	480	6.31	5.20	101.2	0.54	9.80	"

Sample Time (1255)

Samples collected: (3) 8260C, (1) TIM

10/19/15 RFAAP F.B.# 12
B03209-13
WMD/KRC

SWC22

DTW: 9.27 Begin Purge (1313)
Post Purge DTW: 9.31 Initial Purge: clear

TIME	TEMP(°C)	COND(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc
(1315)	15.45	1043	2.79	6.30	51.5	3.10	9.31	clear
(1320)	1481	1022	0.80	6.40	41.5	4.94	9.33	clear
(1325)	14.76	1021	0.49	6.43	32.6	2.53	9.31	clear
(1330)	14.74	1021	0.38	6.45	25.0	3.01	9.33	clear
(1335)	14.72	1021	0.33	6.46	18.7	3.18	9.33	clear
(1340)	14.74	1021	0.30	6.50	10.1	3.65	9.33	clear
(1345)	14.75	1021	0.27	6.48	4.9	4.30	9.33	clear
(1345)	Readings Stable							
(1355)	14.76	1023	0.52	6.49	4.5	5.43	9.31	clear

Sample Time (1350)
Samples Collected: (3)8260C, (1) TM

SWC23

DTW: 8.66 Begin Purge (1402)
Post Purge DTW: 8.76 Initial Purge: clear

TIME	TEMP(°C)	COND(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc
(1405)	15.67	1204	3.03	6.60	2.6	24.2	8.68	clear
(1410)	15.50	1207	2.58	6.59	-3.9	19.7	8.78	clear
(1415)	15.50	1203	2.55	6.60	-11.8	26.9	8.72	clear
(1420)	15.47	1202	2.48	6.60	-15.7	24.4	8.74	clear
(1425)	15.39	1200	2.42	6.60	-15.9	25.1	8.73	clear
(1430)	15.44	1199	2.47	6.61	-16.5	23.6	8.76	clear
(1430)	Readings Stable						8.76	
(1440)	15.25	1217	2.86	6.75	-17.9	25.7	8.76	clear

Sample Time (1435)
Samples Collected: (3)8260C, (1) TM

10/20/15 RFAAP B032047BA RFQ/DWK F.B.#12

General Notes
- Weather:
- PPE - Nitrile gloves, eye protection, steel toed boots, hard hats...
- Calibrations: YSI 650 MPS
  - pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  - Conductivity reads 1413 µs in a 1413 µs std.
  - DO% = 99.6% - HACH Turbidimeter 2100Q
- Dedicated well skirts & tubing used at each well
- All equipment decon'ed before and after event and between use at each sampling location
- All purge water disposed of at dedicated location on-site
- All samples collected, stored and transported on ice in coolers.
- All wells purged and sampled at .25 L/min.
- Sample collection order: 8260, TM
- 8260C preserved with HCL-CG
- TM preserved with HNO_3 - P
- VOAs collected from one pulse from bladder pump
- Bladder pump 4 cycles/min., 5 sec. discharge 10 sec. recharge.

SWC21

DTW: 9.31 Begin Purge (10:37)

Post purge DTW: 9.38 Initial Purge: clear

Time	Temp(C)	Cnd(µs)	DO mg/L	pH	ORP(mv)	Turb (NTU)	DTW	Desc.
(10:40)	14.08	756	4.81	4.56	119.3	11.9	9.41	clear
(10:45)	14.38	721	1.97	4.65	110.6	11.7	9.39	clear
(10:50)	14.49	754	1.19	4.57	112.3	20.9	9.40	clear
(10:55)	14.53	741	0.83	4.54	113.5	23.9	9.40	hazy
(11:00)	14.87	734	1.01	4.55	115.1	21.6	9.41	hazy

10/20/15 RFAAP F.B.#12
B03204-13
12VFC/DWK

SWC 21 CONT.

TIME	TEMP(°C)	COND (µS)	DO (mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	DESC.
(11:05)	15.07	730	1.28	4.56	112.0	19.2	9.38	HAZY
(11:10)	15.19	725	1.34	4.59	108.1	17.7	9.39	HAZY
(11:15)	16.24	723	1.28	4.62	106.7	16.4	9.38	HAZY
(11:15)	READINGS STABLE							

SAMPLE COLLECTION: (11:20) DUPLICATES (11:25)

SAMPLES COLLECTED: 8260 (6) TM (2)

(11:22)	15.38	723	1.59	4.783	104.1	16.7	9.39	HAZY

APPROVED BY John Thacker DWK

DATE 11/5/2016

UNIT 10

MW-10D3D

DTW - 17.91 BEGIN PURGE: (11:47)

POST PURGE DTW- INITIAL PURGE: CLEAR

TIME	TEMP(C)	COND (µS)	D.O. (mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	DESC
(11:50)	14.45	626	6.67	6.71	-22.7	3.89	17.93	CLEAR
(11:55)	14.47	637	6.63	6.84	-18.7	2.40	17.93	CLEAR
(12:00)	14:55	636	6.57	6.94	-14.9	1.09	17.93	CLEAR
(12:05)	14.58	635	6.61	7.00	-12.8	0.71	17.94	CLEAR
(12:10)	14.56	635	6.64	7.03	-11.9	0.59	17.93	CLEAR
(12:15)	14.62	633	6.66	7.05	-12.0	0.55	17.92	CLEAR
(12:15)	READINGS STABLE							

SAMPLE COLLECTION TIME (12:20) DUPS (12:25)

SAMPLES COLLECTED: 8260 (6)

(12:26)	14.72	630	6.76	7.09	-14.3	0.88	17.94	CLEAR

APPROVED BY John Thacker

DATE 11/5/2016

4/21/15 RFAAP FB#12
803204-13
TAE/KFC

SWL2A

DTW: 9.47 Begin Purge (1019)
Post Purge DTW: 9.52 Initial Purge: Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge L	Desc
(1020)	13.20	467	4.94	5.89	130.8	11.8	≤0.3 L/min	Clear
(1025)	13.64	535	2.86	6.25	117.7	6.13	"	clear
(1030)	13.78	539	2.53	6.29	104.8	3.74	"	clear
(1035)	13.81	540	2.43	6.30	98.4	2.59	"	Clear
(1040)	13.91	541	2.30	6.31	92.0	2.23	"	clear
(1045)	13.83	544	2.15	6.33	87.3	1.71	"	clear
(1050)	13.91	543	2.09	6.33	83.1	1.72	"	clear
(1050)	Readings Stable							
(1103)	14.01	544	1.84	6.40	74.7	1.67	Post Purge Reading	

Sample Time (1055)
Samples Collected: (3) 8260C, (1) TAL, (2) 8270D

APPROVED BY Abby Thacker
DATE 12/11/2015

Static Water Level Table - Unit 16

Well		DTW	Post Purge DTW	Notes
16-1		48.53		SWL-only
16-2		55.88	55.97	
16-3		56.30	66.25	
16-5		3.65	12.83	
16WC2B		52.21	62.26	
16MW8		71.19	72.17	
16WC1B		63.98	64.49	
16WC1A	DTW 4/21/15	~~63.98~~ 64.04	66.75	
16MW9		61.64	62.65	
16C1		48.28	48.31	
16C3		63.70		SWL-only
16DDH3		DRY		"
16WC2A		DRY		"

16-2

DTW: 55.88 Begin Purge (1118)
Post Purge DTW: 55.97 Initial Purge: Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge L	Desc
(1120)	12.52	618	8.95	6.81	86.1	1.79	≤0.3L/min	Clear
(1125)	13.11	604	6.49	6.62	87.2	1.06	"	clear
(1130)	13.46	603	6.38	6.64	86.3	0.98	"	Clear
(1135)	13.10	597	6.62	6.61	87.9	0.62	"	Clear
(1140)	13.09	595	6.66	6.61	88.3	0.38	"	Clear
(1145)	13.15	588	6.76	6.61	88.5	0.39	"	Clear
(1150)	13.17	577	6.86	6.58	88.1	0.26	"	Clear
(1155)	13.15	571	6.89	6.56	88.7	0.28	"	Clear
(1155) Readings Stable								
(1214)	13.25	572	6.98	6.62	80.0	0.48	Post Purge Reading	

Sample Time (1200)
Samples Collected: (3) 8260C, (1) TM, (2) 8270D

16-3

DTW: 56.30 Begin Purge (1224)
Post Purge DTW: 66.25 Initial Purge: Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge L	Desc
(1225)	13.15	259	8.75	7.26	66.7	0.90	≤0.3L/min	Clear
(1230)	13.57	256	7.61	7.40	62.4	3.67	"	Clear
(1235)	13.61	255	7.46	7.46	60.6	3.82	"	clear
(1240)	13.59	255	7.42	7.49	59.4	2.71	"	Clear
(1245)	13.57	253	7.47	7.51	59.8	2.60	"	clear
(1250)	13.68	253	7.38	7.52	59.3	2.35	"	clear
(1255)	13.62	253	7.49	7.55	58.8	2.51	"	clear
(1255) Readings Stable								
(1315)	13.91	255	7.89	7.56	51.7	3.88	Post Purge Reading	

Sample Time (1300)
Samples Collected: (3) 8260C, (1) TM, (2) 8270D

4/21/15 RFAAP FB#12
B03204-13
TOPEKA-FC

16-5

DTW: 3.65 Begin Purge (1333)

Post Purge DTW: 12.83 Initial Purge: Clear

Time	Temp(C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge Rate	Desc
(1335)	12.52	530	1.30	6.95	73.3	7.05	≤0.3 L/min	Clear
(1340)	12.43	537	1.08	6.93	67.3	3.20	"	clear
(1345)	12.42	537	1.00	6.92	64.0	2.94	"	clear
(1350)	12.45	537	0.94	6.91	60.6	1.82	"	clear
(1355)	12.33	538	0.91	6.91	59.0	1.98	"	clear
(1400)	12.23	537	0.86	6.91	59.6	1.90	"	clear
(1405)	12.32	537	0.85	6.92	57.8	1.47	"	clear
(1405)	Readings Stable							
(1424)	12.43	544	1.01	7.00	50.0	4.57	Post Purge Reading	

Sample Time (1410)

Samples Collected: (3) 8260C, (1) TPH
(2) 8270D

16 SPRING

Temp(C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)
12.33	583	7.80	6.85	40.2	2.18

Sample Time (1430)

Samples Collected: (3) 8260C, (1) TPH
(2) 8270D

4/22/15 RFAAP B03204-12 TQE/KFC FB#12

General Notes

- Weather: Sunny & 50's
- PPE: Eye Protection, Nitrile Gloves, Steel Toe Boots, Hard Hats
- Calibrations: YSI 650 MDS
  - pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00
  - Conductivity reads 1413 µs in 1413 µs std
  - DO% = 100%
  - HACH 2100Q Turbidimeter: 0.02-1000 NTU
- Dedicated tubing & well skirts used at each location
- All equipment decon'ed before & after event and between use at each sampling location
- All purge water disposed of @ dedicated location onsite
- All samples collected, stored and transported on ice in coolers
- All volatiles samples collected at 0.1 L/min. All other samples collected @ 0.3 L/min.

16WC2B

DTW: 52.21 — Begin Purge (0835)

Post Purge DTW: 62.26 — Initial Purge: clear

Time	Temp(C)	Cond(µs)	DO mg/L	pH	ORP(mv)	Turb(NTU)	Purge h	Desc
(0840)	12.96	327	5.33	7.02	99.2	1.21	≤0.3 L/min	clear
(0845)	13.33	330	1.12	7.30	79.3	5.80	"	clear
(0850)	13.41	331	1.09	7.35	72.1	2.10	"	clear
(0855)	13.60	330	1.02	7.35	64.9	1.15	"	clear
(0900)	13.51	331	0.98	7.36	60.6	0.97	"	clear
(0905)	13.55	332	0.93	7.35	55.9	0.79	"	clear
(0910)	13.63	332	0.91	7.36	51.6	0.89	"	clear
(0910) Readings Stable								
(0931)	13.98	333	0.99	7.42	41.6	1.17	Post Purge Reading	

Sample Time (0915)

Samples Collected: (3) 8260C, (1) TM, ~~(1) CN~~ TQE 4/22/15

(2) 8270D

4/22/15 RFAAP FB#12
BO3204-12
JQE/KPL

16MW8

DTW: 71.19 Begin Purge (0943)
Post Purge DTW: 72.17 Initial Purge: clear

Time	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge	Desc
(0945)	13.60	155	1.97	5.16	172.1	3.36	≤0.3 L/min	clear
(0950)	13.91	160	0.67	4.87	163.2	0.72	"	clear
(0955)	13.99	159	0.55	4.84	158.6	0.80	"	clear
(1000)	13.98	159	0.38	4.82	156.2	1.29	"	clear
(1005)	14.03	159	0.29	4.83	151.9	0.92	"	clear
(1010)	14.11	157	0.28	4.85	147.3	0.80	"	clear
(1010)	Readings Stable							
(1040)	14.55	157	0.31	4.91	138.9	0.64	Post Purge Reading	

Sample Time (1015)
Samples Collected: (6)8260C, (1)TM, (1)CN
(2)8270D

16MW9

DTW: 61.64 Begin Purge (1052)
Post Purge DTW: 62.65 Initial Purge: clear

Time	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge	Desc
(1055)	13.77	818	6.81	6.40	52.1	3.68	≤0.3 L/min	clear
(1100)	13.62	914	1.57	6.23	-33.0	0.30	"	clear
(1105)	13.60	944	0.81	6.27	-40.7	0.19	"	clear
(1110)	13.41	953	0.61	6.25	-41.2	0.14	"	clear
(1115)	13.69	951	0.53	6.28	-40.2	0.19	"	clear
(1120)	13.73	951	0.52	6.28	-40.3	0.23	"	clear
(1125)	13.75	949	0.50	6.28	-39.7	0.21	"	clear
(1125)	Readings Stable							
(1145)	13.85	948	0.72	6.41	-38.5	0.18	Post-Sample Reading	

Sample Time (1130)
Samples Collected: (6)8260C, (1)TM, (1)CN
(2)8270D

4/22/15 RFAAP B03 249-12 TOEIKFC FB#12

16WC18

DTW: 63.98 Begin Purge (1158)

Post Purge DTW: 64.49 Initial Purge: Clear

Time	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge k	Desc
(1200)	13.77	380	6.50	6.43	92.5	2.08	≤0.3 L/min	clear
(1205)	13.79	358	1.08	5.87	98.1	4.42	"	clear
(1210)	13.75	372	0.60	5.86	68.1	4.35	"	clear
(1215)	13.56	380	0.51	5.87	57.9	3.95	"	clear
(1220)	13.58	387	0.41	5.86	48.6	2.68	"	clear
(1225)	13.76	392	0.36	5.87	42.1	8.79	"	clear
(1230)	13.75	399	0.33	5.89	38.1	6.18	"	clear
(1235)	13.84	401	0.32	5.90	34.8	4.72	"	clear
(1235)	Readings Stable							
(1253)	14.31	414	0.55	5.98	22.1	2.25	Post Purge Reading	

Sample Time (1240)

Samples Collected: (6) 8260C, (1) TTM, (1) CN
(2) 8270D

16WC1A

DTW: 64.04 Begin Purge (1306)

Post Purge DTW: 66.75 Initial Purge: Clear

Time	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mV)	Turb(NTU)	Purge k	Desc
(1310)	13.00	631	9.86	6.67	-2.5	3.74	≤0.3 L/min	clear
(1315)	13.15	733	1.61	6.55	18.8	0.34	"	clear
(1320)	13.40	742	0.76	6.54	6.4	0.49	"	clear
(1325)	13.41	745	0.60	6.49	-24.0	0.21	"	clear
(1330)	13.35	745	0.52	6.46	-35.0	0.22	"	clear
(1335)	13.45	743	0.49	6.45	-39.8	0.18	"	clear
(1340)	13.45	741	0.46	6.43	-37.1	0.20	"	clear
(1340)	Readings Stable							
(1422)	13.62	750	0.52	6.50	-50.7	0.27	Post Purge Reading	

Sample Time (1345)

Samples Collected: (18) 8260C, (3) TTM, (1) CN, (4) 8270D

4/22/15 RFAAP FB #12

B032044-12
TGB/KFC

1600 DUP Taken From 1600C1A

Sample Time (1355)
Samples Collected: (6) 8260C, (1) TTM1, (1) CN
(2) 8270D

1600C1

DTW: 48.28 Begin Purge (1434)

Post Purge DTW: 48.31 Initial Purge: clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mV)	Turbi(NTU)	Purge h	Desc
(1435)	13.58	669	8.45	6.84	10.9	0.61	≤0.3 L/min	clear
(1440)	13.41	717	1.39	6.17	57.8	0.48	"	clear
(1445)	13.22	687	0.67	6.08	62.1	0.24	"	clear
(1450)	13.13	681	0.46	6.06	66.1	0.19	"	clear
(1455)	13.37	670	0.37	6.07	68.3	0.24	"	clear
(1500)	13.46	665	0.35	6.08	67.6	0.21	"	clear
(1505)	13.53	663	0.35	6.08	68.9	0.35	"	clear
(1505)	Readings Stable						Post Purge Reading	
(1524)	13.41	662	0.51	6.09	70.1	0.29		

Sample Time (1510)
Samples Collected: (6) 8260C, (1) TTM1 (1) CN
(2) 8270D

APPROVED BY Ashley Tucker
DATE 12/11/2015

5/26/15 RFAAP B632941-13 KFE/MM F.B.#13

General Notes-
- Weather - Mostly sunny & 70°s
- PPE - Nitrile gloves, eye protection, steel toe boots
- CALIBRATIONS: YSI 650 MDS
  pH: 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.98
  Conductivity reads 1413 µs in a 1413 µs std.
  DO% = 100.0%
  HACH 2100P TURBIDIMETER: 0.02-1000 NTU
- Dedicated tubing & well skirts used at each location.
- All equipment decon'ed before & after event and between use at each sampling location.
- All purge water disposed of at dedicated location on-site.
- All samples collected, stored & transported on ice in coolers.
-

16MW9 - ~~DUP~~

DTW: ~~61.64~~ 63.41 Begin Purge (0948)

Post purge DTW: 64.91 Initial Purge: CLEAR

Time	Temp(°C)	Cond(µs)	DO%	pH	ORP(mV)	TURB(NTU)	Rate	Desc
(0950)	14.44	988	~~3.62~~	6.61	-34.4	1.52	≤0.3 L/min	CLEAR
(0955)	14.19	1013	0.83	6.59	-36.3	0.39	"	CLEAR
(1000)	14.08	1004	0.60	6.63	-31.4	0.32	"	CLEAR
(1005)	14.05	1009	0.48	6.66	-32.7	0.21	"	CLEAR
(1010)	14.08	1011	0.42	6.68	-33.4	0.12	"	clear
(1015)	~~14.21 READING STABLE~~	1011	~~0.38~~	6.71	-33.8	0.13	"	clear
(1020)	Reading Stable			6.7 (MDC 5.26.15)	-30.9	0.23		
~~(1025)~~ 1035	14.02	1009	0.44					

Post purge readings

SAMPLE TIME (1020)

SAMPLES COLLECTED: (2) TM

16MW9 - DUP

~~(1025)~~

SAMPLE TIME (1030)

SAMPLES COLLECTED: (2) TM

5/26/15

RFAAA
B032694-13
KFC/MM

F.B.#13

16WC1A

DTW: 65.17

Begin Purge (1048)

Post-purge DTW: 66.30

Initial Purge: CLEAR

Time	Temp (°C)	Cond (µs)	DO (mg/L)	pH	ORP (mV)	TURB (NTU)	PUMP RATE	Desc.
(1050)	15.09	770	9.82	7.25	0.5	1.00	≤0.3 L/MIN	CLEAR
(1055)	14.35	781	2.17	6.94	26.1	0.43	"	CLEAR
(1100)	14.16	786	1.19	6.94	29.4	0.30	"	CLEAR
(1105)	14.23	802	0.79	6.92	-14.4	0.57	"	CLEAR
(1110)	14.49	814	0.65	6.92	-26.0	0.24	"	CLEAR
(1115)	14.79	820	0.61	6.96	-30.3	0.31	"	CLEAR
(1120)	14.60	820	0.58	6.94	-34.5	0.13	"	CLEAR
READING STABLE								
(1130)	14.94	822	0.64	6.96	-35.3	0.44	POST-PURGE READINGS	

SAMPLE TIME: 1125

SAMPLES COLLECTED: 2 (TM)

16WC1A-DUP

SAMPLE TIME: 1135

SAMPLES COLLECTED: (2) TM

APPROVED BY Ashley Thacker

DATE 12/11/2015

10-13-15 RFAAP 303204-13 EFC/WMD F.B. # 12

FAL3

DTW: 64.75 Begin Purge (1053)

Post Purge DTW: 65.58 Initial Purge: clear

TIME	TEMP(°C)	Cond(ms)	DO(mg/L)	pH	ORP(mV)	TURB NTU	DTW	Desc
(1055)	15.40	918	8.15	7.17	172.5	4.84	65.40	clear
(1100)	14.15	1175	2.03	6.60	155.0	146	65.51	cloudy ~~clear~~
(1105)	14.08	1177	1.55	6.58	153.1	245	65.58	cloudy ~~clear~~
(1110)	14.10	1183	1.34	6.59	150.5	230	65.56	cloudy
(1115)	14.91	1182	1.16	6.64	146.3	150	65.55	cloudy
(1120)	14.46	1193	1.23	6.64	146.9	123	65.41	cloudy
(1125)	14.39	1203	1.17	6.62	147.7	96.3	65.53	cloudy
(1125)	Readings Stable							
(1135)	14.63	1208	1.18	6.61	148.3	159	65.58	cloudy

Sample Time (1130)

Samples Collected: (3)8260C, (2)8011, (1) TM

APPROVED BY Ashley Thacker

DATE 1/4/2016

10-13-15 DMM

16-3

DTW: 56.54 Begin Purge (1153)

Post Purge DTW: 67.64 Initial Purge: clear

TIME	TEMP(°C)	Cond(ms)	DO(mg/L)	pH	ORP(mV)	TURB NTU	DTW	Desc
(1155)	15.93	243	8.44	7.79	181.8	2.82	57.81	clear
(1200)	14.68	240	5.81	7.79	167.5	2.51	60.49	clear
(1205)	14.65	239	5.44	7.85	159.7	2.41	61.39	clear
(1210)	14.60	238	5.55	7.90	155.4	1.38	62.51	clear
(1215)	14.58	237	5.67	7.92	152.0	1.04	63.35	clear
(1220)	14.63	236	5.79	7.93	149.8	1.88	64.25	clear
(1220)	Readings Stable							
(1237)	15.10	238	5.88	7.97	147.3	1.36	67.64	clear

Sample Time (1225)

Samples Collected: (6)8260C, (2)8011, (2)8270, (2)TM

10-13-15 RFAAP F.B.#12
B03Z04-13
WMD/KFC

STATIC WATER LEVEL TABLE - HWMU 16

WELL	DTW	Post Purge DTW	NOTES
16-1	47.09		
16-2	55.91	56.03	
16-3	56.54	67.64	
16-5	4.06	15.84	
16WC2B	53.16	64.82	
16MW8	72.42	75.59	
16WC1B	66.28	66.64	
16WC1A	66.19	67.94	
16MW9	63.82	65.15	
16C1	49.54	49.56	
16C3	67.31		
16DDH3	Dry		
16WC2A	Dry		

16-5

DTW: 4.06 Begin Purge (1258)
Post Purge DTW: 15.84 Initial Purge: clear

TIME	TEMP(C)	Cond(ms)	DO(mg/L)	pH	ORP(mV)	TURB(NTU)	DTW	Desc
(1300)	14.95	531	2.41	7.55	204.7	1.93	5.47	clear
(1305)	14.49	536	1.06	7.32	188.5	4.47	8.48	clear
(1310)	14.69	534	0.96	7.34	183.2	2.84	9.68	clear
(1315)	14.65	534	0.89	7.34	179.0	1.90	10.98	clear
(1320)	14.60	534	0.86	7.33	177.1	3.95	12.21	clear
(1325)	14.36	534	0.80	7.31	174.8	4.30	13.35	clear
(1325)	Readings Stable							
(1340)	14.81	544	0.83	7.36	169.6	12.9	15.84	clear

Sample Time (1330)
Samples Collected: (3) 8260, (2) 8270D, (1) TM

10-13-15 RFAAP B03204-13 WMD/KFR FB. #12

16Spring

Temp(°C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	Turb(NTU)
14.19	578	6.85	7.30	142.1	3.41

Sample Time (1345)
Samples Collected: (3)8260C, (2)8270, (1) TM

16WC2B aWMD 10-13-15

DTW: ~~66.12~~ 53.16 Begin Purge (1413)
Post Purge DTW: 64.82 Initial Purge: clear

TIME	TEMP(°C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc.
~~(1405)~~	~~15.10~~	~~382~~	~~3.50~~	~~6.66~~	~~216.5~~	~~9.65~~	aWMD	10-13-15
(1415)	15.58	329	5.65	7.55	188.1	2.82	54.41	clear
(1420)	14.96	326	2.50	7.64	169.7	0.50	56.43	clear
(1425)	14.65	325	0.89	7.68	149.8	0.47	56.98	clear
(1430)	14.64	325	0.65	7.73	135.0	0.30	58.81	clear
(1435)	14.71	324	0.55	7.74	125.8	0.33	59.55	clear
(1440)	14.75	325	0.55	7.74	120.6	0.21	61.72	clear
(1445)	14.81	324	0.58	7.75	116.0	0.31	61.68	clear
(1445)	Readings Stable							
(1500)	15.32	326	0.66	7.76	109.7	0.74	64.82	clear

Sample Time (1450)
Samples Collected: (3)8260C, (2)8270, (1) TM

10/14/15 RFAAP 130320Y-13 RFQ/APP F.B.#

GENERAL NOTES:
- Weather- Partly cloudy, 50°-60°s
- PPE- Eye protection, nitrile gloves, steel toed boots, hard hats
- Calibrations- YSI 556 MPS
  pH: 4.00 = 4.00, 7.00 = 6.98, 10.00 = 10.00
  Conductivity reads 1413 µs in a 1413 µs standard
  DO% = 99.8%
- Dedicated tubing & well skirts used at all wells.
- All equipment decon'ed before and after event and between use at each sampling location.
- All purge water disposed of at dedicated location on-site.
- All samples collected, stored & transported on ice in coolers.
- All wells purged and sampled at 0.25 L/min.
- Sample collection order: 8260, 8011, 8270 & TM
- 8260 & 8011 preserved w/ HCL-CG, TM preserved w/ HNO_3-P

Cont'd. w/ Unit 16

16-2

DTW: 55.91 Begin Purge: (0838)
POST-PURGE DTW: 56.03 Initial Purge - Clear

TIME	Temp(°C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	TURB (NTU)	DTW	Desc.
(0840)	13.52	573	6.19	7.01	35.0	0.58	55.93	Clear
(0845)	13.24	636	4.51	6.95	40.4	0.16	55.94	Clear
(0850)	13.25	640	4.38	6.83	39.5	0.15	55.96	"
(0855)	13.26	636	4.54	6.83	42.5	0.13	55.98	"
(0900)	13.24	632	4.63	6.86	43.9	0.17	55.99	"
(0905)	13.36	625	4.55	6.85	46.5	0.32	56.00	"
(0905)	Readings Stable					~~0.2~~ AP		
(0920)	13.32	613	4.73	6.83	54.1	0.29	56.03	"

Sample Time (0910)
Samples Collected: (3) 8260C, (2) 8270, (1) TM

10/14/15 RFMAP B03209-13 KFC/APP F.B #12

16MW8

DTW: 72.42 Begin Purge (0942)

Post-purge DTW: 75.5 Initial Purge: Clear

TIME	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb (NTU)	DTW	Desc.
(0945)	14.28	155	0.55	5.30	101.3	3.61	~~72.95~~	Clear
(0950)	14.14	129	0.28	5.11	106.5	0.53	73.17	"
(0955)	14.18	129	0.29	5.13	105.0	0.32	73.55	"
(1000)	14.16	124	0.15	5.14	105.5	0.28	73.95	"
(1005)	14.26	123	0.13	5.10	107.3	0.31	74.56	"
(1010)	14.46	132	0.11	5.09	106.7	0.46	75.71	"
(1010)	Readings Stable						AP ~~75.5~~	
(1030)	15.33	144	0.23	5.12	108.3	0.71	75.59	"

Sample Time (1015)

Samples Collected: (3) 8260C, (2) 8270, (1) TM

16WC1-B

DTW: 66.28 Begin Purge: 1048

Post-Purge DTW: 66.64 Initial Purge: Cldy/Sediment

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Turb	DTW	Desc
(1055)	14.39	377	3.00	6.16	135.7	29.5	66.65	Cldy w/ Sediment
(1100)	13.99	372	2.18	6.14	135.8	9.42	66.70	Clear
(1105)	14.16	373	1.97	6.17	135.9	4.39	66.63	Clear
(1110)	14.23	379	1.55	6.18	130.9	2.66	66.61	Clear
(1115)	14.34	385	1.21	6.21	127.2	2.35	66.62	Clear
(1120)	14.19	389	1.06	6.21	124.9	1.91	66.62	Clear
(1120)	Reading Stable						AP ~~66.64~~	
(1135)	15.14	396	1.07	6.29	109.8	2.49	66.64	Clear

Sample Time (1125)

Samples Collected: (3) 8260C, (2) 8270, (1) TM

RD 14/15

RFAAP
B0329Y-13
KFC/APP

F.B.#12

16WC1A

DTW: 66.19 Begin Purge (1144)

Post-Purge DTW: 67.94 Initial Purge (clear)

Time	Temp's	Cond (us)	DO mg/L	PH	ORP	Turb	DTW	Desc
(1145)	15.03	690	6.55	7.25	89.3	0.39	66.99	Clear
(1150)	14.67	737	3.70	7.08	92.5	0.15	67.23	Clear
(1155)	14.52	752	1.83	7.00	95.8	0.16	67.42	Clear
(1200)	14.49	755	1.12	7.02	91.1	0.17	67.37	Clear
(1205)	14.42	765	0.78	6.97	83.0	0.20	67.42	Clear
(1210)	14.52	770	0.62	6.95	80.6	0.15	67.37	Clear
(1215)	14.57	774	0.53	6.98	76.8	0.20	67.36	Clear
(1220)	14.63	776	0.45	6.96	75.7	0.11	67.34	Clear
(1225)	14.76	775	0.39	6.65	73.6	0.22	67.32	Clear
(1230)	14.70	775	0.36	6.93	73.1	0.06	67.33	Clear
(1235)	14.67	775	0.34	6.92	72.9	0.06	67.36	
(1235)	Reading Stable					?		
(1335)	14.89	763	0.33	7.09	34.0	0.14	67.94	Clear

Sample Time (1240)

Samples Collected: (9) 8260c, (6) 8270, (3) TM

16WC1ADUP (Taken from 16WC1ADUP)

Sample Time (1330)

Samples Collected: (3) 8260c, (2) 8270, (1) TM

10/14/15

RFAAP
B03204J13
KFC/APP

F.B.#12

16 MW4

DTW: 63.82 Begin Purge (1337)

Post Purge DTW: 65.15 Initial Purge: Clear

Time	Temp(C)	Cond	DO mg/L	PH	ORP	Turb	DTW	Desc
(1340)	15.04	923	3.75	6.92	73.2	1.09	65.04	Clear
(1345)	13.77	976	0.56	6.62	65.2	0.10	65.34	Clear
(1350)	13.81	976	0.41	6.66	62.3	0.15	62.40	Clear
(1355)	13.73	968	0.30	6.60	62.1	0.21	65.23	Clear
(1400)	13.96	951	0.25	6.68	52.7	0.15	65.12	Clear
(1405)	14.11	941	0.24	6.62	52.8	0.15	65.13	Clear
(1410)	14.15	933	~~0.23~~ 3.33 NP	6.49	54.1	0.14	65.15	Clear
(1410)	Readings Stable							
(1420)	15.68	949	0.25	6.76	45.5	0.14	65.20	Clear

Sample Time: (1415)

Samples Collected: (3) 8260c, (2) 8270, 1 TM

APPROVED BY Ashley Thacker

DATE 1/4/2016

16C1

DTW: 49.54 Begin Purge (1428)

Post Purge DTW: 49.56 Initial Purge: Clear

Time	Temp(C)	Cond (us)	DO ~~mg/L~~	PH	ORP	Turb	DTW	Desc
(1430)	15.08	655	5.27	6.94	67.8	0.28	49.54	Clear
(1435)	14.34	746	1.64	6.60	71.2	0.17	49.54	Clear
(1440)	14.15	772	1.01	6.55	72.8	0.17	49.56	Clear
(1445)	13.98	779	0.74	6.53	73.6	0.18	49.54	Clear
(1450)	13.89	783	0.53	6.53	74.1	0.23	49.59	Clear
(1455)	13.85	782	0.63	6.52	74.7	0.39	49.55	Clear
(1500)	13.82	781	0.58	6.52	75.3	0.13	49.55	Clear
(1505)	13.83	781	0.55	6.53	75.4	[redacted] 0.19 NP	49.56	Clear
(1505)	Readings Stable							
(1520)	14.39	781	0.52	6.51	77.1	0.19	49.56	Clear

Sample Time (1510)

Samples Collected: (3) 8260c, (2) 8270, (1) TM

12/4/2015 RFAAP F.B.#12
B03204-13A
KFC/WMD/MDL

GENERAL NOTES:
- Weather: Sunny/ 30's
- PPE: Nitrile gloves, eye protection, steel toed boots, hard hats
- Calibrations: YSI 650 MPS
  pH: 4.00 = 4.00, 7.00 = 7.01, 10.00 = 10.00
  Conductivity reads 1413 µs in a 1413 µs standard
  D.O.% = 100.0%
  HACH Turbidimeter 2100Q (0.02 - 1000 NTU)
- Dedicated well skirts and tubing used at each well
- All equipment decomed before and after each event and between use at each sample location.
- All purge water disposed of at dedicated location onsite.
- All samples collected, stored, and transported on ice in coolers.
- TM preserved with HNO_3 - P
- Bladder pump 4 cycles/min - 5 sec discharge 10 sec recharge

Control Box Pressure = 110 psi

16WC1A
DTW: 62.97
Post Purge DTW: 64.12
Purge Rate: 0.25 mL/min
Begin Purge (0922)
Initial Purge: clear

TIME	TEMP(C)	Cond(µs)	DO(mg/L)	pH	ORP(mV)	TURB NTU	DTW	Desc
(0925)	11.11	758	5.80	6.68	28.4	0.35	64.11	clear
(0930)	12.14	792	1.75	6.76	15.9	0.17	64.12	clear
(0935)	12.32	788	0.96	6.75	-38.1	0.17	64.17	clear
(0940)	12.37	783	0.67	6.70	-64.0	0.15	64.18	clear
(0945)	12.46	778	0.58	6.66	-73.6	0.14	64.14	clear
(0950)	12.46	775	0.52	6.64	-77.6	0.11	64.13	clear

12/4/2015 RFAAP F.B.#12
B03204-13A
KFC/WMD

16WC1A (Cont'd.)

TIME	Temp(°C)	Cond(µs)	DO mg/L	pH	ORP(mV)	TURB (NTU)	DTW	Desc.
(0955)	12.50	776	0.47	6.62	-80.1	0.16	64.14	clear
(1000)	12.61	772	0.43	6.62	-81.2	0.10	64.14	clear
(1000)	Readings stable							
(1010)	12.48	772	0.70	6.62	-92.4	0.11	64.12	clear

Sample Time (1005)
Samples Collected (2) TM

16WDUP Taken from 16WC1A
Sample Time (1005)
Bottle sample time is (1010)
Samples Collected: (2) TM

APPROVED BY Ashley Thacker
DATE 11/5/2016

APPENDIX E

CORRESPONDENCE (CD-ROM)

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

May 1, 2015

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

RE: Alternate Source Demonstration for colbalt in monitoring well 16WC1B, HWMU #16, Radford Army Ammunition Plant, Radford, VA
EPA ID# VA1210020730

Dear Mr. Stewart:

The above-referenced Alternate Source Demonstration (ASD) investigation, submitted on behalf of Radford Army Ammunition Plant, by BAE Systems, Ordinance Systems Inc., dated February 15, 2015, has been reviewed for technical content and consistency with the requirements of 40 CFR 264.99.(i). The need to submit an ASD was triggered by an exceedence of the cobalt Groundwater Protection Standard during the fourth quarter of 2013 for monitoring well 16WC1B. The exceedence was reported by the facility and a 90-day extension of the ASD due date was granted by the Department on January 21, 2014.

As defined under 40 CFR 264.99.(i), the ASD report must show one of the following in order to obtain approval:

1) A source other than a regulated unit caused the contamination.
2) The contamination was caused by natural variation in groundwater.
3) The contamination was a result of an error in field sampling.
4) The contamination was the result of an error in lab analysis.
5) The statistically significant increase contamination was result of an error in statistical analysis.

The ASD report focused on proving the applicability of item #2 by presenting information regarding the natural variability and a trend analysis for this historically detected contaminant of concern. The report concludes that cobalt concentrations observed are not derived from the closed HWMU-16, but because cobalt is typically found as a trace element within the type of bedrock (dolomite) within which monitoring well 16WC1B is screened.

Based on a review of the ASD, the Department requests that cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year. Subsequently, the ASD may be revised to include those results and submitted to the Department. At that time, the Department will review the revised ASD and determine whether it meets the regulatory criteria for approval. The revised ASD, to include the additional data, should be submitted within 90 days of collection of the last semi-annual sample.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager

cc: RAAP Correspondence File
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, Draper Aden
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

May 20, 2015

Jutta Schneider
Program Manager,
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **11th Corrective Action Groundwater Monitoring Event Notification - HWMU-5**
Semiannual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Ms. Schneider:

The following information pertains to routine detection notification for the recent semiannual groundwater monitoring event for HWMUs 5 and 16.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Second Quarter 2015, BAE Systems, Ordnance Systems Inc. (BAE) completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The Second Quarter 2015 event served as the 11th semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The Second Quarter 2015 groundwater monitoring event also served as annual monitoring under 40 CFR 264 Appendix IX for HWMU-16. The laboratory analytical data packages for this event were received on May 14, 2015. The following information summarizes the findings of the Second Quarter 2015 semiannual activities at each Unit.

HWMU-5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Second Quarter 2015, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC21, 5WC22, and 5WC23 at concentrations of 3.2 µg/l, 3.5 µg/l, and 4.6 µg/l respectively, which are less than the GPS of 5 µg/l.

Total cobalt was detected in POC wells 5WC21, 5WC22, and 5WC23 at concentrations of 64.9 µg/l, 17 µg/l, and 11.1 µg/l respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l.

TCE and total cobalt were not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.
This event also served as the sixth annual monitoring event in which the POC wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List) since corrective action annual monitoring began in Second Quarter 2010. Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous constituents that are not the targets for the current CA (e.g., TCE and its daughter products) are present at concentrations greater than their respective GPSs. No other additional hazardous constituents that are not targets for the current CA for the Unit were detected at concentrations greater than their respective GPS during Second Quarter 2015.

HWMU-16

In accordance with the Final Hazardous Waste Post-Closure Care Permit, the groundwater data from the POC wells at HWMU 16 were compared to the established GPS for the Unit as revised in the VDEQ-approved *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The following constituents were detected in the POC wells for HWMU 16 at concentrations greater than their respective GPS:

- Total cobalt was detected in POC well 16WC1B at a concentration of 22.3 µg/l, which is greater than the GPS of 5 µg/l. In accordance with Permit Condition V.J.4.i.(3)(c) and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year." A revised ASD incorporating these results will be submitted to the VDEQ within 90 days following collection of the last semiannual sampling event in 2016. Due to the pending VDEQ ASD review, a verification event will not be conducted at POC well 16WC1B for cobalt.

- Total cobalt was detected in POC wells 16WC1A and 16MW9 at a concentrations of 5.8 µg/l and 5.3 µg/l, respectively, which are greater than the GPS of 5 µg/l. However, it should be noted that the cobalt concentration in 16WC1A and 16MW9 is below the cobalt concentration in POC well 16WC1B discussed above, and below the recently revised VDEQ alternate concentration limit (ACL) for cobalt (6 µg/l), effective February 15, 2015. A verification event will be scheduled on or before May 29, 2014, in order to confirm or refute the concentrations reported in POC wells 16WC1A and 16MW9.

The following constituents were detected at concentrations at or above their respective background concentrations in plume monitoring wells:

- Total barium was detected in plume monitoring wells 16-2, 16-3, and 16Spring at concentrations of 207 µg/l, 695 µg/l, and 195 µg/l, respectively, which are greater than the site-specific background concentration of 175.4 µg/l. However, these concentrations are less than the USEPA MCL for barium of 2,000 µg/l. Higher barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells (16-2, 16-3, and 16-5) and former plume well (now piezometer) 16-1 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Second Quarter 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3, and 16Spring is recommended at this time.

The following Appendix IX constituents were detected at or above the detection limit (DL) at HWMU-16:

Well Location	Constituent	Concentration	DL	Units
16C1	Tetrahydrofuran	14 J	2	µg/l

Note: J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.

Tetrahydrofuran detected in upgradient well 16C1 will not be verified, as upgradient well 16C1 is the background well rather than a POC well. Furthermore, sampling of well 16C1 for Appendix IX constituents is not required per the Post-Closure Care Permit for the Unit; therefore, tetrahydrofuran will not be added to the groundwater compliance monitoring list for HWMU-16.

To summarize, **samples will be collected from the following wells on or before May 29, 2015**, in order to verify or refute the initial reported detection discussed above:

Well Location	Constituent(s)
HWMU-16	
16MW9	Cobalt
16WC1A	Cobalt

Complete details regarding the Second Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Second Quarter 2015*, which is due to the VDEQ by August 15, 2015.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Kurt Kochan, VDEQ-CO

bc: BAE Administrative File
J. McKenna, ACO Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

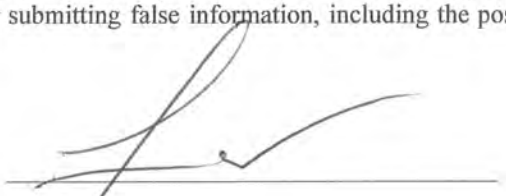
Coordination: J. McKenna

15-0900-075

Concerning the following:

CY 2015 Second Quarter Semiannual Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: 

PRINTED NAME: Luis A. Ortiz
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

June 29, 2015

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: REVISED 2014 Annual Report – Hazardous Waste Management Units (HWMU) 5 and 16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the Revised 2014 Annual Report for the above listed facility, dated June 2015, submitted to the Virginia Department of Environmental Quality Office of Remediation Programs (Department) by BAE Systems/Draper Aden Associates on behalf of the Radford Army Ammunitions Plant (RAAP). The Report was reviewed with respect to the facility's Hazardous Waste Permit and Groundwater Corrective Action & Monitoring Program.

Based on the Department's review of the groundwater potentiometric surface map and elevation data, and a review of the groundwater sampling data provided in the submission, the monitor well network appears to have operated in a manner sufficient to characterize the groundwater flow rate and direction during the 2014 calendar year. The monitoring network would therefore identify potential impacts to the uppermost aquifer from these units. The Department concludes that the requirements of the facility's permit have been met and therefore accepts the revised 2014 Annual Report as submitted.

As previously directed in a letter from the Department dated May 1, 2015, RAAP should continue to monitor cobalt concentrations in monitoring well 16WC1B. Following completion of the additional monitoring, the previously submitted Alternate Source Demonstration (ASD) may be revised to include those results and submitted to the Department for review.

EPA ID#: VA1210020730
Radford Army Ammunitions Plant
Radford, Virginia
June 29, 2015

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Respectfully,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

July 30, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **Semiannual Groundwater Monitoring Report –**
HWMU-5 and HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The Hazardous Waste Management Units (HWMUs) 5 & 16 Semiannual Groundwater Monitoring Report for Second Quarter 2015 can be accessed at:

RPT - 15 0729- 2Qtr 2015 Report Units 5-16 - DEQ.pdf
https://files.daa.com/dl/mNBQOluWLf/RPT%20-%2015%200729-%202Qtr%202015%20Report%20Units%205-16%20-%20DEQ.pdf_

This report meets the requirements of the Semiannual Groundwater Monitoring Report for Second Quarter 2015 for the Post-Closure Care Permit for HWMU 5 and 16 at RFAAP.

If you have any questions or concerns, please contact me at 540/639-7785 (jay.stewart@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.

Enclosure

c: Aziz Farahmand, VDEQ-BRRO (w/ enclosure)
Kurt W. Kochan, VDEQ-Central (w/ enclosure)

Coordination: J. McKenna

bc: Administrative File
J. Stewart
J. McKenna, ACO Staff
Matt Alberts
Mike Lawless, Draper Aden Associates

15-0900-115

Concerning the following:

CY 2015 Second Quarter Semiannual Groundwater Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

November 23, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **12th Corrective Action Groundwater Monitoring Event Notification - HWMU-5**
Semiannual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The following information pertains to routine detection notification for the recent semiannual groundwater monitoring event for Hazardous Waste Management Units (HWMUs) 5 and 16.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Fourth Quarter 2015, BAE completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. Groundwater monitoring activities were conducted in accordance with the *Final Hazardous Waste Management Post-Closure Care Permit* (Permit) for HWMUs 5 and 16 (original effective date October 4, 2002, reissued August 16, 2014). The Fourth Quarter 2015 event served as the twelfth semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with the Permit. The laboratory analytical data packages for this event were received on November 19, 2015. The following information summarizes the findings of the Fourth Quarter 2015 semiannual activities at each Unit.

HWMU 5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Fourth Quarter 2015, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 2.9 µg/l, 3.3 µg/l, and 4.4 µg/l, respectively, which are less than the GPS of 5 µg/l.

Total cobalt was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 75.2 µg/l, 23.9 µg/l, and 7.08 µg/l, respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l.

As stated in the 2014 Annual Groundwater Monitoring Report for the Unit (approved in VDEQ correspondence dated June 29, 2015) TCE remedial endpoints have been achieved. During Second and Fourth Quarters 2015, TCE was not detected at concentrations greater than its GPS in any of the wells comprising the CA groundwater monitoring network

No changes to the continuation of the groundwater CA program are anticipated at this time. An evaluation of the effectiveness of the Corrective Action will be presented in the forthcoming Annual Groundwater Monitoring Report for Units 5 and 16, which is due to the VDEQ on March 1, 2016.

HWMU 16

In accordance with the Final Hazardous Waste Post-Closure Care Permit, the groundwater data from the POC wells at HWMU 16 were compared to the established GPS for the Unit as revised in the VDEQ-approved *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The following constituents were detected in the POC wells for HWMU 16 at concentrations greater than their respective GPS:

- HWMU-16: Total cobalt was detected in POC well 16WC1B at a concentration of 17 µg/l, which is greater than the revised GPS of 5 µg/l. In accordance with the Permit and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year." A revised ASD incorporating these results will be submitted to the VDEQ within 90 days following collection of the last semiannual sampling event. Due to the pending VDEQ ASD review, a verification sample for analysis for total cobalt was not collected from point of compliance well 16WC1B.

- Additionally, total cobalt was detected in POC well 16WC1A at a concentration of 5.38 µg/l, which is greater than the revised GPS of 5 µg/l. However, it should be noted that the cobalt concentration in 16WC1A is below the cobalt concentration in POC well 16WC1B discussed above, and below the recently revised VDEQ alternate concentration limit (ACL) for cobalt (6 µg/l), effective February 15, 2015. A verification sampling event will be scheduled on or before December 11, 2015 in order to confirm or refute the total cobalt concentration reported in POC well 16WC1A.

The following constituents were detected at concentrations at or above their respective background concentrations in plume monitoring wells:

- HWMU-16: Total barium was detected in plume monitoring wells 16-2, 16-3, 16-5 and 16Spring at concentrations of 231 µg/l, 755 µg/l, 182, and 219 µg/l, respectively, which are greater than the site-specific background concentration of 175.4 µg/l. However, these concentrations are less than the USEPA MCL for barium of 2,000 µg/l. Higher barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Fourth Quarter 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3,16-5 and 16Spring is recommended at this time.

Complete details regarding the Fourth Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Fourth Quarter 2015, which will be combined with the 2015 Annual Groundwater Monitoring Report for the Units as directed by the VDEQ on May 4, 2011. The 2015 Annual Groundwater Monitoring Report is due to the VDEQ by March 1, 2016.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Brett Fisher, VDEQ-CO

bc: BAE Administrative File
J. McKenna, Army Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination: J. McKenna

Concerning the following:

CY 2015 Fourth Quarter Semiannual Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

December 9, 2015

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: 12th Corrective Action Groundwater Monitoring Event - HWMU-5
Semiannual Detection Notification – HWMU-16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the 12th Corrective Action Groundwater Monitoring Event - HWMU-5, Semiannual Detection Notification – HWMU-16 dated November 23, 2015, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

It appears that no new targeted constituents were detected during the groundwater monitoring activities conducted during the Fourth Quarter of 2015 for HWMU-5. However, total cobalt was detected in Point of Compliance (POC) monitoring wells 16WC1B and 16WC1A at concentrations of 17 micrograms per liter (ug/L) and 5.38 ug/L, respectively at HWMU-16. These concentrations are greater than the Groundwater Protection Standard (GPS) of 5 ug/L for total cobalt for this unit. RFAAP had previously submitted an Alternate Source Demonstration (ASD) to the Department indicating that the detections of cobalt in this well were due to natural variation. As the report points out, the Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. The Department requests that the requested monitoring continue at this time.

EPA ID#: VA1210020730
Radford Army Ammunitions Plant
Radford, Virginia
December 9, 2015

The Department again acknowledges the presence of barium above the site-specific background concentration. The Department recognizes the variability of the lithology in the area of HWMU-16 that could potentially account for the natural variation of this trace element. No further investigation is required at this time; however, the Department may request further investigation if the barium levels in groundwater increase in the future.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA

BAE SYSTEMS

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

December 14, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Notification of Groundwater Verification Sample Results and Extension Request for Alternate Source Demonstration Post Closure Care Permit HWMUs 5 & 16 Radford Army Ammunition Plant, Radford, Virginia EPA ID#: VA1210020730

Dear Mr. Kochan:

During Fourth Quarter 2015, BAE Systems, Ordnance Systems Inc., completed semiannual groundwater monitoring for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. On December 4, 2015, RFAAP collected a verification sample from HWMU-16 point of compliance well 16WC1A to confirm or refute an initial detection of total cobalt at a concentration greater than the Groundwater Protection Standard (GPS) of 5 ug/l. Total cobalt was detected in the verification sample at a concentration of 6.78 ug/l (initial sample result 5.38 ug/l), which is greater than the GPS of 5 ug/l.

A map of HWMU-16 illustrating the distribution of total cobalt concentrations in groundwater at the Unit is attached. As shown in the attached map, point of compliance well 16WC1A is part of a nested pair with point of compliance well 16WC1B, and both wells are installed within similar lithologic conditions. During Fourth Quarter 2015, total cobalt was detected in point of compliance well 16WC1B at a concentration of 17 ug/l, which is greater than the GPS of 5 ug/l and consistent with previous total cobalt concentrations detected in this well. In accordance with the Permit and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored semiannually for at least a minimum of one additional year." In correspondence dated December 9, 2015, the VDEQ again requested RFAAP to continue additional semiannual monitoring for total cobalt at this well in support of the ASD.

The VDEQ-approved Class 3 Permit Modification dated September 27, 2011, reduced the GPS for total cobalt at HWMU-16 from 313 ug/l to 5 ug/l. As shown in the attached table summarizing historical total cobalt concentrations detected at HWMU-16, the total cobalt concentrations detected in point of compliance well 16WC1A from Second Quarter 2003 through Second Quarter 2011 typically were below 313 ug/l but greater than 5 ug/l. The Fourth Quarter 2015 total cobalt concentration detected in point of compliance well 16WC1A is consistent with the concentrations detected in that well prior to the reduction of the GPS to 5 ug/l in September 2011.

Permit Condition V.J.2.i.(3) specifies that RFAAP may conduct an ASD to evaluate whether the total cobalt concentration detected in well 16WC1A was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. Due to the proximity of well 16WC1A with well 16WC1B, RFAAP proposes to conduct semiannual monitoring for total cobalt at well 16WC1A in conjunction with semiannual monitoring for total cobalt at well 16WC1B as requested by the VDEQ in the May 1, 2015 correspondence, and to evaluate the results in a combined ASD for both point of compliance wells.

Permit Condition V.J.2.i.(3)(d) states that the results of the ASD must be submitted to the VDEQ within 90 days of this notification letter. However, a component of this ASD is the collection of independent samples through 2016. Therefore, RFAAP requests an extension to the Permit-specified 90-day deadline for the ASD. RFAAP proposes to

submit the results of the ASD to the VDEQ within 90 days following completion of the additional semiannual monitoring requested in the VDEQ correspondence date May 1, 2015.

Complete details regarding the Fourth Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Fourth Quarter 2015, which will be combined with the 2015 Annual Groundwater Monitoring Report for the Units as directed by the VDEQ on May 4, 2011. The 2015 Annual Groundwater Monitoring Report is due to the VDEQ by March 1, 2016.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

Attachments:
Figure 1 - 2015 4Q - Total Cobalt Concentrations -HWMU 5
Table 1 – Total Cobalt Concentrations 2003-2015
VDEQ Correspondence - May 1, 2015
VDEQ Correspondence - December 8, 2015

c: Aziz Farahmand, VDEQ-BRRO
Brett Fisher, VDEQ-CO

bc: BAE Administrative File
J. McKenna, Army Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination: J. McKenna

15-0900-187

Concerning the following:

CY 2015 Fourth Quarter Semiannual Monitoring Event -
Notification of Groundwater Verification Sample Results and
Extension Request for Alternate Source Demonstration
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

January 5, 2016

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: Notification of Groundwater Verification Sample Results and Extension Request for Alternate Source Demonstration
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the above-referenced correspondence dated December 14, 2015, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

During sampling conducted in the Fourth Quarter of 2015 at HWMU-16, total cobalt was detected in Point of Compliance (POC) monitoring wells 16WC1B and 16WC1A at concentrations of 17 micrograms per liter (ug/L) and 5.38 ug/L, respectively. These concentrations are greater than the Groundwater Protection Standard (GPS) of 5 ug/L for total cobalt for this unit. Total cobalt was detected at 6.78 ug/L in the subsequent verification sampling performed on POC monitoring well 16WC1A.

RFAAP had previously submitted an Alternate Source Demonstration (ASD) to the Department indicating that the detections of cobalt in this well were due to natural variation. The Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. The Facility is requesting that the ASDs for monitoring wells 16WC1A and 16WC1B be combined. Further, the Facility is requesting that the results of the ASD be allowed to be submitted within 90 days of the additional semiannual sampling requested by the Department in a letter dated May 1, 2015.

Based upon the construction and proximity of the wells to each other, the Department concurs with the Facility to combine the ASDs and agrees to the extension request as proposed.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

May 20, 2015

Jutta Schneider
Program Manager,
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **11th Corrective Action Groundwater Monitoring Event Notification - HWMU-5**
Semiannual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Ms. Schneider:

The following information pertains to routine detection notification for the recent semiannual groundwater monitoring event for HWMUs 5 and 16.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Second Quarter 2015, BAE Systems, Ordnance Systems Inc. (BAE) completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. The Second Quarter 2015 event served as the 11th semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with the *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The Second Quarter 2015 groundwater monitoring event also served as annual monitoring under 40 CFR 264 Appendix IX for HWMU-16. The laboratory analytical data packages for this event were received on May 14, 2015. The following information summarizes the findings of the Second Quarter 2015 semiannual activities at each Unit.

HWMU-5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Second Quarter 2015, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC21, 5WC22, and 5WC23 at concentrations of 3.2 µg/l, 3.5 µg/l, and 4.6 µg/l respectively, which are less than the GPS of 5 µg/l.

Total cobalt was detected in POC wells 5WC21, 5WC22, and 5WC23 at concentrations of 64.9 µg/l, 17 µg/l, and 11.1 µg/l respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l.

TCE and total cobalt were not detected in any of the other wells in the CA groundwater monitoring network. Additionally, the TCE daughter products were not detected in any of the wells comprising the CA groundwater monitoring network.
This event also served as the sixth annual monitoring event in which the POC wells at HWMU-5 were sampled for the constituents listed in Appendix K to Permit Attachment 2 (Groundwater Corrective Action Annual Monitoring List) since corrective action annual monitoring began in Second Quarter 2010. Annual monitoring for the constituents listed in Appendix K is required in order to evaluate whether additional hazardous constituents that are not the targets for the current CA (e.g., TCE and its daughter products) are present at concentrations greater than their respective GPSs. No other additional hazardous constituents that are not targets for the current CA for the Unit were detected at concentrations greater than their respective GPS during Second Quarter 2015.

HWMU-16

In accordance with the Final Hazardous Waste Post-Closure Care Permit, the groundwater data from the POC wells at HWMU 16 were compared to the established GPS for the Unit as revised in the VDEQ-approved *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The following constituents were detected in the POC wells for HWMU 16 at concentrations greater than their respective GPS:

- Total cobalt was detected in POC well 16WC1B at a concentration of 22.3 µg/l, which is greater than the GPS of 5 µg/l. In accordance with Permit Condition V.J.4.i.(3)(c) and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year." A revised ASD incorporating these results will be submitted to the VDEQ within 90 days following collection of the last semiannual sampling event in 2016. Due to the pending VDEQ ASD review, a verification event will not be conducted at POC well 16WC1B for cobalt.

- Total cobalt was detected in POC wells 16WC1A and 16MW9 at a concentrations of 5.8 µg/l and 5.3 µg/l, respectively, which are greater than the GPS of 5 µg/l. However, it should be noted that the cobalt concentration in 16WC1A and 16MW9 is below the cobalt concentration in POC well 16WC1B discussed above, and below the recently revised VDEQ alternate concentration limit (ACL) for cobalt (6 µg/l), effective February 15, 2015. A verification event will be scheduled on or before May 29, 2014, in order to confirm or refute the concentrations reported in POC wells 16WC1A and 16MW9.

The following constituents were detected at concentrations at or above their respective background concentrations in plume monitoring wells:

- Total barium was detected in plume monitoring wells 16-2, 16-3, and 16Spring at concentrations of 207 µg/l, 695 µg/l, and 195 µg/l, respectively, which are greater than the site-specific background concentration of 175.4 µg/l. However, these concentrations are less than the USEPA MCL for barium of 2,000 µg/l. Higher barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells (16-2, 16-3, and 16-5) and former plume well (now piezometer) 16-1 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Second Quarter 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3, and 16Spring is recommended at this time.

The following Appendix IX constituents were detected at or above the detection limit (DL) at HWMU-16:

Well Location	Constituent	Concentration	DL	Units
16C1	Tetrahydrofuran	14 J	2	µg/l

Note: J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.

Tetrahydrofuran detected in upgradient well 16C1 will not be verified, as upgradient well 16C1 is the background well rather than a POC well. Furthermore, sampling of well 16C1 for Appendix IX constituents is not required per the Post-Closure Care Permit for the Unit; therefore, tetrahydrofuran will not be added to the groundwater compliance monitoring list for HWMU-16.

To summarize, **samples will be collected from the following wells on or before May 29, 2015**, in order to verify or refute the initial reported detection discussed above:

Well Location	Constituent(s)
HWMU-16	
16MW9	Cobalt
16WC1A	Cobalt

Complete details regarding the Second Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Second Quarter 2015*, which is due to the VDEQ by August 15, 2015.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Kurt Kochan, VDEQ-CO

bc: BAE Administrative File
J. McKenna, ACO Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

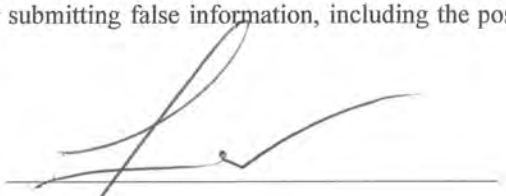
Coordination: J. McKenna

15-0900-075

Concerning the following:

CY 2015 Second Quarter Semiannual Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: 

PRINTED NAME: Luis A. Ortiz
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

June 5, 2015

Jutta Schneider
Program Manager,
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Notification of Groundwater Verification Sample Results
Post Closure Care Permit HWMUs 5 & 16
Radford Facility Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Ms. Schneider:

During Second Quarter 2015, BAE Systems, Ordnance Systems, Inc., (BAE) completed semiannual groundwater monitoring for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia. Due to observed detections of cobalt above the groundwater protection standard (GPS) in compliance wells at HWMU 16, a verification event was conducted. This correspondence summarizes the results of the verification event.

On May 26, 2015, verification samples were collected from HWMU-16 point of compliance (POC) wells 16WC1A and 16MW9 to confirm or refute the initial detection of total cobalt in both samples at concentrations greater than the GPS of 5 µg/l. Total cobalt was not detected at concentrations greater than the GPS in the verification samples collected from wells 16WC1A or 16MW9; therefore, no further action is required. The following table summarizes the verification event results:

Well Location	Constituent	Concentration Initial Semiannual Groundwater Monitoring Event April 22 , 2015	Concentration Verification Event May 26, 2015	Permit QL	GPS	Units
16C1A	Total Cobalt	5.8	4.3 J	5	5	µg/l
16MW9	Total Cobalt	5.3	4.84 J			

Note: J denotes analyte detected less than the quantitation limit (QL) and concentration is estimated.
SW-846 Method 6020A

Additionally, total cobalt was detected in POC well 16WC1B during the April 2015 groundwater monitoring event at a concentration of 22.3 µg/l, which is greater than the GPS of 5 µg/l. In accordance with Permit Condition V.J.2.i.(3)(c) and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year." A revised ASD incorporating these results will be submitted to the VDEQ within 90 days following collection of the last semiannual sampling event in 2016.

Complete details regarding the Second Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming *Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Second Quarter 2015*, which is due to the VDEQ by August 15, 2015.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Kurt Kochan, VDEQ-CO

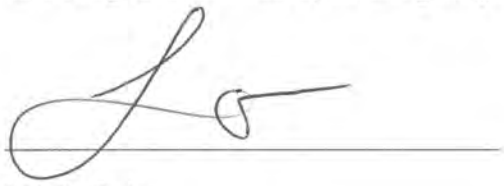
bc: BAE Administrative File
J. McKenna, ACO Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination: J. McKenna

Concerning the following:

CY 2015 Second Quarter Semiannual Monitoring Event -
Final Groundwater Monitoring Results Notification
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Facility Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: 

PRINTED NAME: Luis A. Ortiz

TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett

TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

June 29, 2015

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: REVISED 2014 Annual Report – Hazardous Waste Management Units (HWMU) 5 and 16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the Revised 2014 Annual Report for the above listed facility, dated June 2015, submitted to the Virginia Department of Environmental Quality Office of Remediation Programs (Department) by BAE Systems/Draper Aden Associates on behalf of the Radford Army Ammunitions Plant (RAAP). The Report was reviewed with respect to the facility's Hazardous Waste Permit and Groundwater Corrective Action & Monitoring Program.

Based on the Department's review of the groundwater potentiometric surface map and elevation data, and a review of the groundwater sampling data provided in the submission, the monitor well network appears to have operated in a manner sufficient to characterize the groundwater flow rate and direction during the 2014 calendar year. The monitoring network would therefore identify potential impacts to the uppermost aquifer from these units. The Department concludes that the requirements of the facility's permit have been met and therefore accepts the revised 2014 Annual Report as submitted.

As previously directed in a letter from the Department dated May 1, 2015, RAAP should continue to monitor cobalt concentrations in monitoring well 16WC1B. Following completion of the additional monitoring, the previously submitted Alternate Source Demonstration (ASD) may be revised to include those results and submitted to the Department for review.

EPA ID#: VA1210020730
Radford Army Ammunitions Plant
Radford, Virginia
June 29, 2015

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Respectfully,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

July 30, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **Semiannual Groundwater Monitoring Report –**
HWMU-5 and HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The Hazardous Waste Management Units (HWMUs) 5 & 16 Semiannual Groundwater Monitoring Report for Second Quarter 2015 can be accessed at:

RPT - 15 0729- 2Qtr 2015 Report Units 5-16 - DEQ.pdf
https://files.daa.com/dl/mNBQOluWLf/RPT%20-%2015%200729-%202Qtr%202015%20Report%20Units%205-16%20-%20DEQ.pdf_

This report meets the requirements of the Semiannual Groundwater Monitoring Report for Second Quarter 2015 for the Post-Closure Care Permit for HWMU 5 and 16 at RFAAP.

If you have any questions or concerns, please contact me at 540/639-7785 (jay.stewart@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.

Enclosure

c: Aziz Farahmand, VDEQ-BRRO (w/ enclosure)
Kurt W. Kochan, VDEQ-Central (w/ enclosure)

Coordination: J. McKenna

bc: Administrative File
J. Stewart
J. McKenna, ACO Staff
Matt Alberts
Mike Lawless, Draper Aden Associates

15-0900-115

Concerning the following:

CY 2015 Second Quarter Semiannual Groundwater Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

November 23, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: **12th Corrective Action Groundwater Monitoring Event Notification - HWMU-5**
Semiannual Detection Notification – HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

The following information pertains to routine detection notification for the recent semiannual groundwater monitoring event for Hazardous Waste Management Units (HWMUs) 5 and 16.

Groundwater Monitoring Event Notification - HWMU-5 and HWMU-16

During Fourth Quarter 2015, BAE completed semiannual groundwater monitoring for HWMUs 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. Groundwater monitoring activities were conducted in accordance with the *Final Hazardous Waste Management Post-Closure Care Permit* (Permit) for HWMUs 5 and 16 (original effective date October 4, 2002, reissued August 16, 2014). The Fourth Quarter 2015 event served as the twelfth semiannual Corrective Action (CA) groundwater monitoring event for HWMU-5 conducted in accordance with the Permit. The laboratory analytical data packages for this event were received on November 19, 2015. The following information summarizes the findings of the Fourth Quarter 2015 semiannual activities at each Unit.

HWMU 5

For this event, all wells in the CA groundwater monitoring network were sampled for the constituents listed in Appendix J to Permit Attachment 2 (Groundwater Corrective Action Targeted Constituents - GPS and Semiannual Monitoring List for HWMU-5). The CA groundwater monitoring network for HWMU-5 consists of upgradient well 5W8B, point of compliance (POC) wells 5W5B, 5W7B, 5WC21, 5WC22, and 5WC23, and plume monitoring well 5W12A. During Fourth Quarter 2015, groundwater samples collected from all of the wells in the CA groundwater monitoring network were analyzed for the CA Targeted Constituents: trichloroethene (TCE) and its daughter products 1,1-dichloroethene (1,1-DCE), *cis*-1,2-dichloroethene (*c*DCE), *trans*-1,2-dichloroethene (*t*DCE), and vinyl chloride (VC). Additionally, samples collected from all of the wells in the CA groundwater monitoring network were analyzed for total cobalt, which was added to the list of CA Targeted Constituents as directed by the VDEQ on May 4, 2011.

TCE was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 2.9 µg/l, 3.3 µg/l, and 4.4 µg/l, respectively, which are less than the GPS of 5 µg/l.

Total cobalt was detected in POC wells 5WC21, 5WC22 and 5WC23 at concentrations of 75.2 µg/l, 23.9 µg/l, and 7.08 µg/l, respectively, which are greater than the GPS of 7 µg/l. Total cobalt was detected in POC well 5W7B at a concentration less than the QL of 5 µg/l.

As stated in the 2014 Annual Groundwater Monitoring Report for the Unit (approved in VDEQ correspondence dated June 29, 2015) TCE remedial endpoints have been achieved. During Second and Fourth Quarters 2015, TCE was not detected at concentrations greater than its GPS in any of the wells comprising the CA groundwater monitoring network

No changes to the continuation of the groundwater CA program are anticipated at this time. An evaluation of the effectiveness of the Corrective Action will be presented in the forthcoming Annual Groundwater Monitoring Report for Units 5 and 16, which is due to the VDEQ on March 1, 2016.

HWMU 16

In accordance with the Final Hazardous Waste Post-Closure Care Permit, the groundwater data from the POC wells at HWMU 16 were compared to the established GPS for the Unit as revised in the VDEQ-approved *Final Hazardous Waste Post-Closure Care Permit for HWMUs 5 and 16* (reissued August 16, 2014). The following constituents were detected in the POC wells for HWMU 16 at concentrations greater than their respective GPS:

- HWMU-16: Total cobalt was detected in POC well 16WC1B at a concentration of 17 µg/l, which is greater than the revised GPS of 5 µg/l. In accordance with the Permit and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored for at least a minimum of one additional year." A revised ASD incorporating these results will be submitted to the VDEQ within 90 days following collection of the last semiannual sampling event. Due to the pending VDEQ ASD review, a verification sample for analysis for total cobalt was not collected from point of compliance well 16WC1B.

- Additionally, total cobalt was detected in POC well 16WC1A at a concentration of 5.38 µg/l, which is greater than the revised GPS of 5 µg/l. However, it should be noted that the cobalt concentration in 16WC1A is below the cobalt concentration in POC well 16WC1B discussed above, and below the recently revised VDEQ alternate concentration limit (ACL) for cobalt (6 µg/l), effective February 15, 2015. A verification sampling event will be scheduled on or before December 11, 2015 in order to confirm or refute the total cobalt concentration reported in POC well 16WC1A.

The following constituents were detected at concentrations at or above their respective background concentrations in plume monitoring wells:

- HWMU-16: Total barium was detected in plume monitoring wells 16-2, 16-3, 16-5 and 16Spring at concentrations of 231 µg/l, 755 µg/l, 182, and 219 µg/l, respectively, which are greater than the site-specific background concentration of 175.4 µg/l. However, these concentrations are less than the USEPA MCL for barium of 2,000 µg/l. Higher barium concentrations in downgradient plume monitoring wells relative to background at HWMU-16 may be the result of natural variations in trace element distribution in groundwater. As illustrated in the boring logs for the compliance network monitoring wells (Appendix H of Permit Attachment 3), upgradient well 16C1 is screened in limestone while downgradient plume monitoring wells 16-2, 16-3, and 16-5 are screened in shale and fault breccia. Such differing lithologic formations would be expected to contain very different trace element distributions. Therefore, no further action regarding the Fourth Quarter 2015 total barium concentrations detected in plume monitoring wells 16-2, 16-3,16-5 and 16Spring is recommended at this time.

Complete details regarding the Fourth Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Fourth Quarter 2015, which will be combined with the 2015 Annual Groundwater Monitoring Report for the Units as directed by the VDEQ on May 4, 2011. The 2015 Annual Groundwater Monitoring Report is due to the VDEQ by March 1, 2016.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Brett Fisher, VDEQ-CO

bc: BAE Administrative File
J. McKenna, Army Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination: J. McKenna

Concerning the following:

CY 2015 Fourth Quarter Semiannual Monitoring Event
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

December 9, 2015

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: 12th Corrective Action Groundwater Monitoring Event - HWMU-5
Semiannual Detection Notification – HWMU-16
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the 12th Corrective Action Groundwater Monitoring Event - HWMU-5, Semiannual Detection Notification – HWMU-16 dated November 23, 2015, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

It appears that no new targeted constituents were detected during the groundwater monitoring activities conducted during the Fourth Quarter of 2015 for HWMU-5. However, total cobalt was detected in Point of Compliance (POC) monitoring wells 16WC1B and 16WC1A at concentrations of 17 micrograms per liter (ug/L) and 5.38 ug/L, respectively at HWMU-16. These concentrations are greater than the Groundwater Protection Standard (GPS) of 5 ug/L for total cobalt for this unit. RFAAP had previously submitted an Alternate Source Demonstration (ASD) to the Department indicating that the detections of cobalt in this well were due to natural variation. As the report points out, the Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. The Department requests that the requested monitoring continue at this time.

EPA ID#: VA1210020730
Radford Army Ammunitions Plant
Radford, Virginia
December 9, 2015

The Department again acknowledges the presence of barium above the site-specific background concentration. The Department recognizes the variability of the lithology in the area of HWMU-16 that could potentially account for the natural variation of this trace element. No further investigation is required at this time; however, the Department may request further investigation if the barium levels in groundwater increase in the future.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA

BAE SYSTEMS

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

December 14, 2015

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Notification of Groundwater Verification Sample Results and Extension Request for Alternate Source Demonstration Post Closure Care Permit HWMUs 5 & 16 Radford Army Ammunition Plant, Radford, Virginia EPA ID#: VA1210020730

Dear Mr. Kochan:

During Fourth Quarter 2015, BAE Systems, Ordnance Systems Inc., completed semiannual groundwater monitoring for Hazardous Waste Management Units (HWMUs) 5 and 16 located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. On December 4, 2015, RFAAP collected a verification sample from HWMU-16 point of compliance well 16WC1A to confirm or refute an initial detection of total cobalt at a concentration greater than the Groundwater Protection Standard (GPS) of 5 ug/l. Total cobalt was detected in the verification sample at a concentration of 6.78 ug/l (initial sample result 5.38 ug/l), which is greater than the GPS of 5 ug/l.

A map of HWMU-16 illustrating the distribution of total cobalt concentrations in groundwater at the Unit is attached. As shown in the attached map, point of compliance well 16WC1A is part of a nested pair with point of compliance well 16WC1B, and both wells are installed within similar lithologic conditions. During Fourth Quarter 2015, total cobalt was detected in point of compliance well 16WC1B at a concentration of 17 ug/l, which is greater than the GPS of 5 ug/l and consistent with previous total cobalt concentrations detected in this well. In accordance with the Permit and as directed in VDEQ correspondence dated January 21, 2014, RFAAP submitted an alternate source demonstration (ASD) to evaluate whether the total cobalt concentration detected in well 16WC1B was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. In subsequent correspondence from VDEQ dated May 1, 2015, VDEQ requested "cobalt concentrations in monitoring well 16WC1B be monitored semiannually for at least a minimum of one additional year." In correspondence dated December 9, 2015, the VDEQ again requested RFAAP to continue additional semiannual monitoring for total cobalt at this well in support of the ASD.

The VDEQ-approved Class 3 Permit Modification dated September 27, 2011, reduced the GPS for total cobalt at HWMU-16 from 313 ug/l to 5 ug/l. As shown in the attached table summarizing historical total cobalt concentrations detected at HWMU-16, the total cobalt concentrations detected in point of compliance well 16WC1A from Second Quarter 2003 through Second Quarter 2011 typically were below 313 ug/l but greater than 5 ug/l. The Fourth Quarter 2015 total cobalt concentration detected in point of compliance well 16WC1A is consistent with the concentrations detected in that well prior to the reduction of the GPS to 5 ug/l in September 2011.

Permit Condition V.J.2.i.(3) specifies that RFAAP may conduct an ASD to evaluate whether the total cobalt concentration detected in well 16WC1A was due to 1) a source other than the Unit; 2) errors in sampling, analysis, and evaluation; or 3) natural variation in groundwater. Due to the proximity of well 16WC1A with well 16WC1B, RFAAP proposes to conduct semiannual monitoring for total cobalt at well 16WC1A in conjunction with semiannual monitoring for total cobalt at well 16WC1B as requested by the VDEQ in the May 1, 2015 correspondence, and to evaluate the results in a combined ASD for both point of compliance wells.

Permit Condition V.J.2.i.(3)(d) states that the results of the ASD must be submitted to the VDEQ within 90 days of this notification letter. However, a component of this ASD is the collection of independent samples through 2016. Therefore, RFAAP requests an extension to the Permit-specified 90-day deadline for the ASD. RFAAP proposes to

submit the results of the ASD to the VDEQ within 90 days following completion of the additional semiannual monitoring requested in the VDEQ correspondence date May 1, 2015.

Complete details regarding the Fourth Quarter 2015 monitoring event (field data, laboratory data, and data validation reports) will be forwarded to the VDEQ in the forthcoming Semiannual Groundwater Monitoring Report for Hazardous Waste Management Units 5 and 16, Fourth Quarter 2015, which will be combined with the 2015 Annual Groundwater Monitoring Report for the Units as directed by the VDEQ on May 4, 2011. The 2015 Annual Groundwater Monitoring Report is due to the VDEQ by March 1, 2016.

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

Attachments:
Figure 1 - 2015 4Q - Total Cobalt Concentrations -HWMU 5
Table 1 – Total Cobalt Concentrations 2003-2015
VDEQ Correspondence - May 1, 2015
VDEQ Correspondence - December 8, 2015

c: Aziz Farahmand, VDEQ-BRRO
Brett Fisher, VDEQ-CO

bc: BAE Administrative File
J. McKenna, Army Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination: J. McKenna

15-0900-187

Concerning the following:

CY 2015 Fourth Quarter Semiannual Monitoring Event -
Notification of Groundwater Verification Sample Results and
Extension Request for Alternate Source Demonstration
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

January 5, 2016

Mr. Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.
4050 Pepper's Ferry Road
Radford, Virginia 24141

VIA ELECTRONIC MAIL

Re: Notification of Groundwater Verification Sample Results and Extension Request for Alternate Source Demonstration
Radford Army Ammunitions Plant
Route 114, Radford, Virginia 24141
EPA ID#: VA1210020730

Dear Mr. Stewart:

This letter acknowledges the receipt and review of the above-referenced correspondence dated December 14, 2015, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by BAE Systems on behalf of the Radford Army Ammunitions Plant (RFAAP).

During sampling conducted in the Fourth Quarter of 2015 at HWMU-16, total cobalt was detected in Point of Compliance (POC) monitoring wells 16WC1B and 16WC1A at concentrations of 17 micrograms per liter (ug/L) and 5.38 ug/L, respectively. These concentrations are greater than the Groundwater Protection Standard (GPS) of 5 ug/L for total cobalt for this unit. Total cobalt was detected at 6.78 ug/L in the subsequent verification sampling performed on POC monitoring well 16WC1A.

RFAAP had previously submitted an Alternate Source Demonstration (ASD) to the Department indicating that the detections of cobalt in this well were due to natural variation. The Department requested a minimum of one year of additional monitoring of this well prior to making a decision on this ASD request. The Facility is requesting that the ASDs for monitoring wells 16WC1A and 16WC1B be combined. Further, the Facility is requesting that the results of the ASD be allowed to be submitted within 90 days of the additional semiannual sampling requested by the Department in a letter dated May 1, 2015.

Based upon the construction and proximity of the wells to each other, the Department concurs with the Facility to combine the ASDs and agrees to the extension request as proposed.

If you have any additional technical questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: RAAP Correspondence File
Brett Fisher, VDEQ-CO
Russ McAvoy, VDEQ-CO
Aziz Farahmand, VDEQ-BRRO
Andrea Barbieri, EPA Region 3
Jim McKenna, ACO Staff
Matt Albers, BAE
Mike Lawless, DAA

BAE SYSTEMS

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

January 13, 2016

Mr. Kurt Kochan
Office of Remediation Programs
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Proposed Sampling Schedule and Reporting for Cobalt ASD – 16WC1A and 16WC1B
HWMU-5 and HWMU-16
Post Closure Care Permit HWMUs 5 & 16
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Kochan:

In response to your January 5, 2016 correspondence, below is a proposed schedule for the requested additional semiannual groundwater monitoring at HWMU 16 associated with the pending cobalt ASD effort for monitoring wells 16WC1A and 16WC1B.

Proposed Sampling and Reporting Schedule for Cobalt Alternate Source Demonstration (ASD) RFAAP – HWMU 16 – 16WC1A and 16WC1B		
Proposed Date	**Quarter**	**Comment**
April	2nd Quarter 2016	Sampling conducted as part of routine semiannual groundwater monitoring.
October	4th Quarter 2016	
November	4th Quarter 2016	Receipt of 4th Quarter 2016 sample results from laboratory (i.e., approximately 30 days from 4th Quarter 2016 sample collection date).
February	1st Quarter 2017	Combined ASD Report to DEQ – within 90 days from 4th Quarter 2016 semiannual groundwater monitoring event.

If you have any questions or concerns, please contact me at 540/639-7785 (jay.stewart@baesystems.com).

Sincerely,

Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.

Enclosure

c: Aziz Farahmand, VDEQ-BRRO (w/ enclosure)
Kurt W. Kochan, VDEQ-Central (w/ enclosure)

Coordination: J. McKenna

bc: Administrative File
J. Stewart
J. McKenna, Army Staff
Matt Alberts
Mike Lawless, Draper Aden Associates

16-0900-017

Concerning the following:

CY 2016 Proposed Schedule for Cobalt ASD Semiannual Sampling and Combined ASD Reporting for HWMU 16
Hazardous Waste Management Units 5 – Correction Action Groundwater Monitoring
Hazardous Waste Management Unit 16 – Compliance Groundwater Monitoring
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Alicia M. Masson
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: William M. Barnett
TITLE: General Manager
BAE Systems

From:	Kochan, Kurt (DEQ)
To:	Alberts, Matt (US)
Cc:	Stewart, Jay (US); McKenna, Jim; Farahmand, Aziz (DEQ); Mike Lawless; Janet Frazier
Subject:	RE: 16-0900-017 RFAAP Proposed Sampling Schedule and Reporting for Cobalt ASD
Date:	Thursday, February 04, 2016 2:48:33 PM

Matt-

The proposed sampling and reporting schedule for the cobalt ASD at HWMU-16 is acceptable to the Department. The ASD report should be submitted to the Department by the end of the first quarter of 2017. Please let me know if you have any questions.

Regards,

Kurt

Kurt W. Kochan
Corrective Action Project Manager
Virginia Department of Environmental Quality
Office of Remediation Programs
P.O. Box 1105
Richmond, VA 23218
(703) 583-3825

From: Alberts, Matt (US) [mailto:matt.alberts@baesystems.com]
Sent: Monday, January 25, 2016 3:57 PM
To: Kochan, Kurt (DEQ)
Cc: Stewart, Jay (US); McKenna, Jim; Farahmand, Aziz (DEQ); Mike Lawless (mlawless@daa.com); Janet Frazier (jfrazier@daa.com)
Subject: 16-0900-017 RFAAP Proposed Sampling Schedule and Reporting for Cobalt ASD

Mr. Kochan – see attached transmittal letter concerning the proposed schedule for Cobalt ASD semi-annual sampling and combined ASD reporting for HWMU 16.

Thank You,
Matt

Matt Alberts
BAE Systems Environmental
Radford Army Ammunition Plant
Office: 540-639-8722
Mobile: 540-383-5463