



VIA ELECTRONIC MAIL

February 7, 2018

Richelle Hanson, Project Manager
Voluntary Cleanup Program
Maryland Department of the Environment
Land and Materials Administration
1800 Washington Blvd., Suite 625
Baltimore, Maryland 21230

**Subject: Quarterly Status Report No. 5 - Offsite Area
 Former Kop-Flex Facility Site, Hanover, Maryland**

Dear Richelle:

On behalf of EMERSUB 16 LLC, a subsidiary of Emerson Electric Co., WSP USA Inc. (WSP) is submitting this quarterly status report describing the investigation and remediation activities conducted in the fourth quarter 2017 in the offsite portion of the Former Kop-Flex Facility Site in Hanover, Maryland. The report also describes the activities planned for the first quarter of 2018.

If you have any questions, please do not hesitate to contact us at 703-709-6500.

Kind regards,

Robert E. Johnson
Senior Technical Manager
Water & Environment

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Encl.

cc: Mr. Erich Weissbart, U.S. Environmental Protection Agency, Region III
 Mr. Stephen Clarke, Emerson Electric Co.
 Sheila Harvey, Esquire, Pillsbury Winthrop Shaw Pittman

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QUARTERLY STATUS REPORT NO. 5 – OFFSITE AREA

**FORMER KOP-FLEX FACILITY SITE
OCTOBER 2017 THROUGH DECEMBER 2017**

Site Name: Former Kop-Flex Facility
Site Address: 7565 Harmans Road
Hanover, Maryland 21076

Consultant: WSP USA Inc.
Address: 13530 Dulles Technology Drive, Suite 300
Herndon, Virginia 20171
Phone No.: (703) 709-6500

Project Coordinator: Eric Johnson, WSP USA
Alternate: Lisa Bryda, WSP USA

1.0 Offsite Activities Conducted During October 2017 through December 2017

1.1 Residential Well Sampling

Phase 1,2, and 4 Areas

- WSP continued with sampling of the residential wells in the Phase 1, 2, and 4 areas during the reporting period. Over the period from June 1, 2017 to December 31, 2017, water samples have been collected from 18 wells in the previously sampled Phase 1 & 2 areas and 22 wells in the new Phase 4 area. The status of the residential well sampling activities as of the end of the reporting period is depicted in Figure 1.

Table 1 summarizes the analytical results for the 40 wells sampled from June 2017 through December 2017. Copies of the certified laboratory reports for the well samples collected during the reporting period are included in Enclosure A. No site-related volatile organic compounds (VOCs), including 1,4-dioxane, have been detected at concentrations above the U.S. Environmental Protection Agency (EPA) federal drinking water standards and MDE groundwater quality standards, which represent the groundwater comparative criteria, in any of the samples collected to date from the wells in the Phase 1 & 2 areas or from the new Phase 4 area.

- For the residential well at 919 Redmore Drive, the treated water sample collected on October 10, 2017, had a concentration of 1,2-dichloropropane, which is not a site-related VOC, slightly above the comparative groundwater quality criteria. The presence of the 1,2-dichloropropane exceedance in this sample was immediately communicated to the homeowner and Maryland Department of the Environment (MDE). Given the unexpected detection of this non-site related compound, the well water system for the home was re-sampled on November 2, 2017, to confirm the presence of this VOC. 1,2-Dichloropropane was not detected above the method reporting limit in the second round of water samples. Evaluation of the sampling data suggests the detection of 1,2-dichloropropane was unrelated to the groundwater being pumped from the water supply well but more likely attributed to the resident's rare use of the whole-house water treatment system prior to the initial sampling. Low concentrations of 1,2-dichloropropane could have been present in stagnant water residing in the off-line treatment system, and this stagnant water may have mixed with "fresh" groundwater at the time of sample collection, resulting in the low detection of this compound in the October 2017 sample.

Well-Specific Monitoring

- Given previous detections of 1,1-dichloroethene (DCE) and 1,4-dioxane in the untreated well water at 1227 Old Camp Meade Road, MDE requested that quarterly sampling be conducted of this potable well. The pre-treatment water sample collected in late September 2017 had a 1,1-DCE concentration of 7.8 µg/l, which exceeded the comparative groundwater quality standard of 7 µg/l; this compound was not detected above the applicable criterion in the post-treatment sample. In addition, 1,4-dioxane was detected at concentrations of 4.6 µg/l in the untreated water and 3.5 µg/l in the treated water. WSP verbally communicated the 1,4-dioxane results for these water samples to MDE on October 10, 2017. Since the 1,4-dioxane levels in both the untreated and treated water were approaching the updated risk-based action level of 4.6 µg/l, MDE required EMERSUB 16 to initiate monthly sampling of the well at 1227 Old Camp Meade Road.



In accordance with MDE's requirement, pre- and post-treatment water samples were collected from this residential well on the following dates during the reporting period:

- October 30, 2017
- November 30, 2017
- December 15, 2017

Historical analytical results, including those for the 4th Quarter 2017 samples, are summarized in Table 2. Copies of the certified laboratory analytical reports for the October 2017 through December 2017 sampling events are included in Enclosure B.

As with previous samples, site-related VOCs were detected in both the untreated and treated water samples, with 1,1-DCE and 1,4-dioxane present at the highest levels. In the untreated water, concentrations of 1,1-DCE ranged from 6 µg/l to 11.5 µg/l (Figure 2), while 1,4-dioxane was present at levels below 3 µg/l (Figure 3). Only the October 2017 sample of the untreated water had a concentration of 1,1-DCE that exceeded the comparative groundwater quality criteria (Table 2). The treated water samples had 1,1-DCE concentrations ranging from below the method reporting limit of 0.5 µg/l to a maximum of 2.8 µg/l, with all levels below the comparative criterion of 7 µg/l. As shown in the Figure 3 data plot, the concentrations of 1,4-dioxane in the treated water samples range from 2.1 µg/l to 2.6 µg/l, and were very similar to the levels detected in the untreated water. EMERSUB 16 and WSP communicated the analytical results for these water samples to the homeowner and MDE.

- As discussed in the previous offsite progress report, the analytical results for the September 2017 sample collected from the residential well at 7740 Twin Oaks Road had a 1,1-DCE concentration above the comparative groundwater quality criterion. Based on this finding, the neighboring homeowner at 7742 Twin Oaks Road contacted WSP on October 10th to inquire about the water quality for the private well on their property. (The location of this property is shown in Figure 1.) Since previous (2013 through 2014) water samples from this well had detected trace to very low concentrations of site-related VOCs, EMERSUB 16 and WSP decided to collect another well sample to gather updated information on VOC concentrations in the well discharge.

On October 18, 2017, a water sample was collected from the private well at 7742 Twin Oaks Road. A copy of the certified laboratory analytical report for this well sample is included in Enclosure A. Site-related VOCs were detected in the water sample, including 1,1-DCE (2.8 µg/l) and 1,4-dioxane (1.3 µg/l), although neither compound exceeded the groundwater comparative criteria. The 1,1-DCE level in the recent sample was approximately 3x higher than the average concentration of the quarterly well water samples collected in 2014. WSP communicated the analytical results for the October 2017 water sample to the homeowner and MDE. Given the apparent increase in the 1,1-DCE concentration, WSP recommends the inclusion of the well at 7742 Twin Oaks Road in the semi-annual residential well monitoring program.

1.2 Quarterly Offsite Groundwater Sampling

- The offsite monitoring wells located south of the Site were sampled on November 14, 2017, using a passive sampling device (HydraSleeve™). The sample retrieval depths for each monitoring well are consistent with those from the previous monitoring events and are provided in the table below.

Well ID	Depth to Water (feet BGS)	Well Depth (feet BGS)	Well Screen Interval (feet BGS)	Sample Interval (feet BGS)
MW-24D	51.99	128.5	118.5 – 128.5	124.5 – 127
MW-25	14.60	40	30 - 40	35 – 37.5
MW-25D-130	58.46	130	120 - 130	125 – 127.5
MW-25D-190	58.71	192	180 - 190	185 – 187.5
MW-28	27.22	45	35 – 45	40 – 42.5
MW-28D	89.03	210	200 – 210	205 – 207.5
MW-31D	107.21	280	270 - 280	275 – 277.5
MW-33D-235	124.55	235	225 – 235	230 – 232.5
MW-33D-295	124.36	295	285 – 295	290 – 292.5
MW-35D	125.59	298	288 – 298	293 – 295.5



- A potentiometric surface contour map of the confined portion of the Lower Patapsco aquifer based on the November 2017 water level data is shown in Figure 4. Hydraulic heads in the area north of Maryland Route 100 show the influence of groundwater withdrawals from the deep recovery wells at the former Kop-Flex Site. For the area south of the highway, evaluation of the hydraulic heads indicates groundwater flow in a south-southeast direction consistent with the flow paths before the start of remedial pumping from the aquifer.
- The November 2017 analytical results for samples from the offsite monitoring wells are presented in Table 3. A copy of the certified laboratory analytical report for these samples is provided in Enclosure C. Historical groundwater sampling data for the offsite monitoring wells can be found in Table 4.

No site-related VOCs – chlorinated ethanes and ethenes and 1,4-dioxane - were detected in the samples from the shallow wells (MW-25 and MW-28) screened in the unconfined zone of the Lower Patapsco aquifer. Concentrations of the primary site-related VOCs in the confined Lower Patapsco aquifer south of Maryland Route 100 are provided in Figure 5. For the deep wells at the MW-25/MW-25D location, the total concentration of site-related VOCs in the MW-25D-130 sample (222.3 µg/l), which is screened from 120-130 feet BGS, is higher than the concentration of 151.1 µg/l for the deeper well at this location (MW-25D-190). The difference in the VOC levels primarily reflects the variation in the 1,1-DCE concentrations between the well samples. The lower VOC concentrations in the sample from MW-25D-190 are consistent with the vertical distribution of constituents in onsite and offsite areas north of Maryland Route 100. The sampling data for the deep monitoring wells located further downgradient (MW-28D, MW-31D, MW-35D, and the paired MW-33D wells) indicate non-detect to very low concentrations of site-related VOCs. The only site-related constituent exceeding the Groundwater Quality Standards was 1,4-dioxane in the MW-33D-295 sample (9.7 ug/L). Overall, the concentrations of the primary site-related VOCs in the November 2017 groundwater samples from wells screened in the confined portion of the Lower Patapsco aquifer are similar with the levels detected in the May 2017 and August 2017 samples.

In addition to the site-related VOCs, methylene chloride was detected at low concentrations ranging from 11.5 ug/L to 12 ug/L in the samples from unconfined zone well MW-25 and confined zone wells MW-33D-235 and MW-33D-295. A very low concentration of this compound (1.7 µg/l) was also found in the trip blank associated with this sampling event. Given the methylene chloride detection in this field quality control sample and the sporadic presence in the well samples, it appears that trace amounts of this compound somehow diffused into the water during the field sampling activities. Thus, the methylene chloride detections do not reflect the actual groundwater quality conditions.

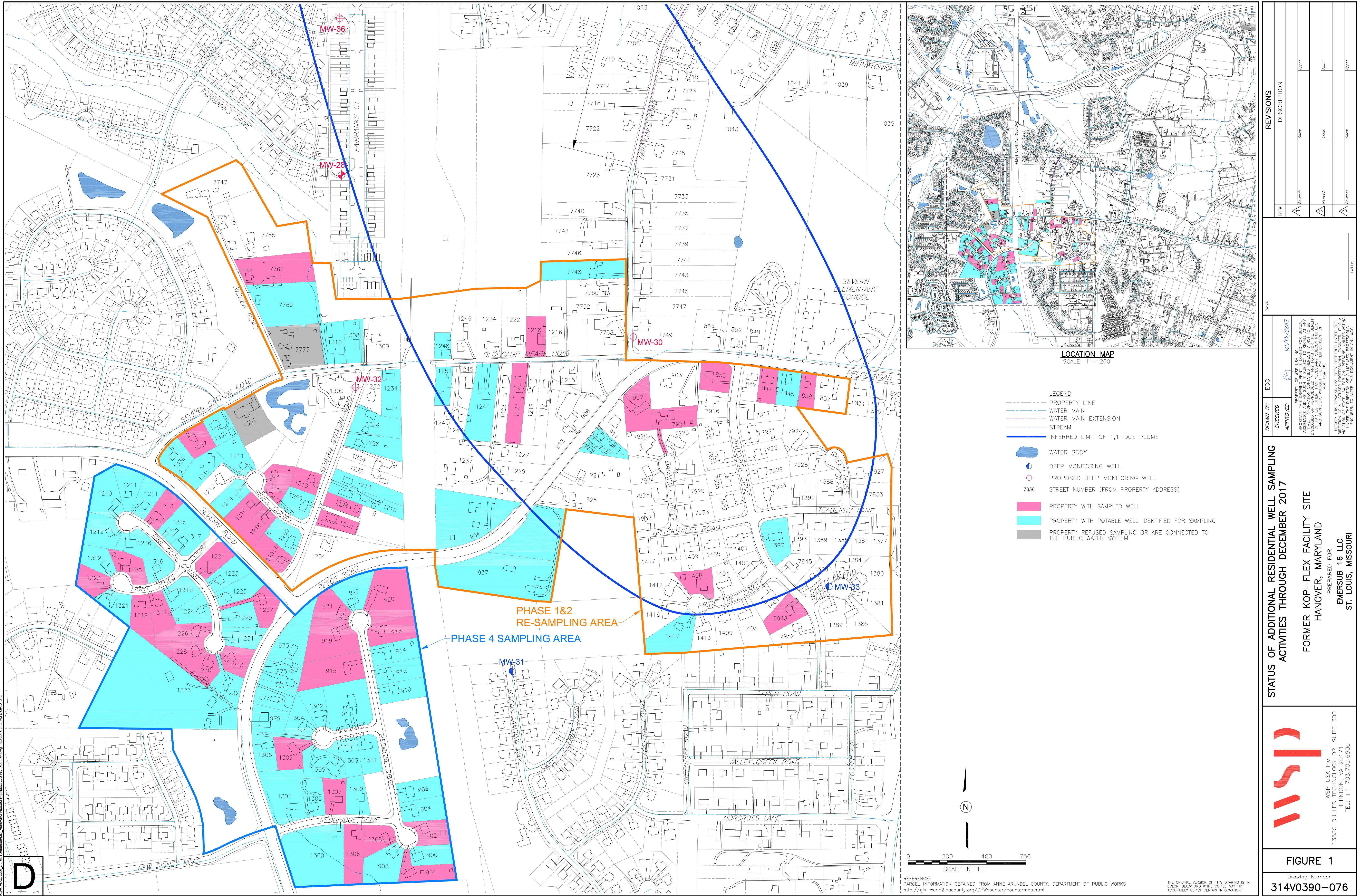
2.0 Planned Offsite Activities for Next Reporting Period (January 2018 Through March 2018)

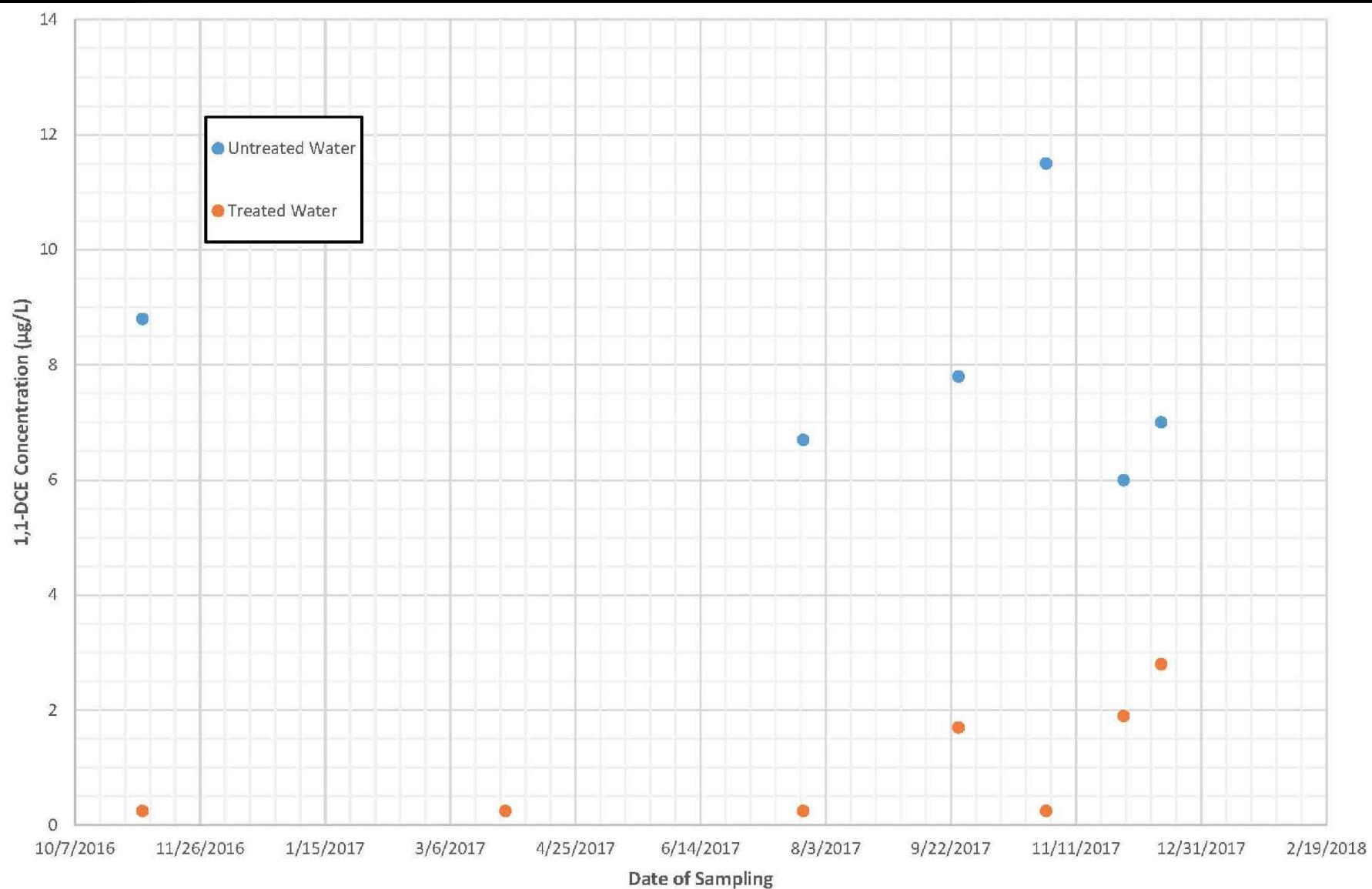
- Continue to communicate with Anne Arundel County Department of Public Works regarding the review of information for the Right-of-Way permit application for the additional groundwater monitoring wells. Upon issuance of the permits, begin preparations for the installation of the monitoring wells in accordance with the approved Offsite Groundwater Monitoring Plan.
- Execute an access agreement for the performance of groundwater profiling and well installation activities at the adjoining Verizon property immediately to the north of the Site.
- Conduct quarterly sampling of the offsite monitoring wells in residential areas south of Maryland Route 100 in February 2018.
- Continue with monitoring of untreated and treated water from the residential well at 1227 Old Camp Meade Road.
- Complete the public water service connection for the residence at 7740 Twin Oaks Road and subsequent abandonment of the water supply well on the property.
- Conduct the next round of semi-annual monitoring of the designated residential wells, which will include the well located at 7742 Twin Oaks Road.

3.0 Key Personnel/Facility Changes

During the reporting period, there were no changes to either key project personnel or conditions relevant to the performance of the ongoing work at the site.

FIGURES





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NOTE:
DATA POINTS WITH CONCENTRATIONS OF .025 $\mu\text{g}/\text{l}$ CORRESPOND TO NON-DETECT RESULTS. VALUE PLOTTED REPRESENTS 1/2 OF THE METHOD REPORTING LIMIT.



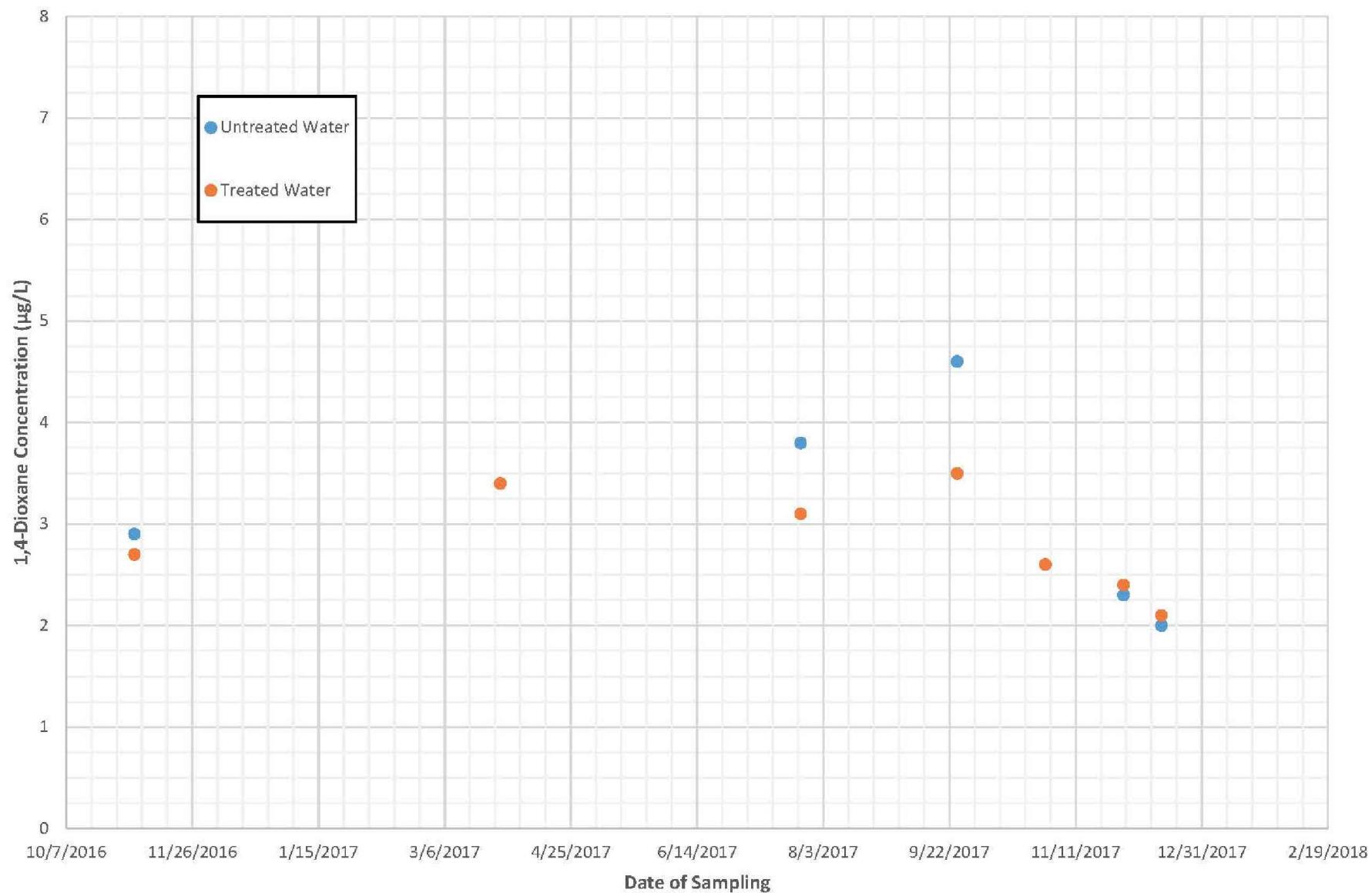
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Figure 2
1,1-DICHLOROETHENE CONCENTRATIONS
IN WELL WATER SAMPLES FROM
1227 OLD CAMP MEADE ROAD (2016 TO PRESENT)

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Drawn By: EGC
Checked:
Approved: RGJ 1/18/2018
DWG Name: 314V0390-077

A



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Figure 3
1,4-DIOXANE CONCENTRATIONS
IN WELL WATER SAMPLES FROM
1227 OLD CAMP MEADE ROAD (2016 TO PRESENT)

FORMER KOP-FLEX FACILITY
HANOVER, MARYLAND
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Drawn By: EGC
Checked:
Approved: RGJ 1/18/2018
DWG Name: 314V0390-077



LEGEND

- PROPERTY LINE
- STREAM
-  WATER BODY
-  SHALLOW AND DEEP MONITORING WELLS
-  DEEP MONITORING WELL
-  POTENIOMETRIC SURFACE ELEVATION (FEET MSL)
-  POTENIOMETRIC SURFACE CONTOUR
(DASHED WHERE INFERRED)
-  INFERRRED GROUNDWATER FLOW DIRECTION

REVISIONS		DESCRIPTION	
REV			
	<i>MML</i>	<i>Revised:</i> <i>Chka:</i>	
	<i>RH</i>	<i>Revised:</i> <i>Chka:</i>	
	<i>DATE</i>	<i>Revised:</i> <i>Chka:</i>	
<p>POTENTIOMETRIC SURFACE CONTOUR MAP FOR CONFINED ZONE IN THE LOWER PATAPSCO AQUIFER NOVEMBER 14, 2017</p> <p>FORMER KOP-FLEX FACILITY SITE HANOVER, MARYLAND</p> <p>PREPARED FOR</p> <p>EMERSUB 16 LLC ST. LOUIS, MISSOURI</p> <p>WSP USA Inc.</p> <p>13530 DULLES TECHNOLOGY DR, SUITE 300 HERNDON, VA 20171 TEL: +1 703.709.6500</p> <p>NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. IT IS A VIOLATION OF STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY.</p>			
<p>FIGURE 4</p> <p>Drawing Number 314V0390-084</p>			



TABLES

Table 1

Residential Well Sampling Results
Former Kop-Flex Facility Site
June 2017 through September 2017

Address	Sample ID	Sampling Date	Parameter:	Acetone	Bromoform	Chloroform	Dibromochloromethane	1,2-Dichloroethane	1,1-Dichloroethylene	Methyl Tert Butyl Ether	1,1,1-Trichloroethane	Tetrachloroethylene	Trichloroethylene	1,4-Dioxane	
			Units:	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
		Groundwater Standard:		550 (a)	80 (a)	80 (a)	80 (a)	5	7	20 (a)	200	5	5	6.7 (b)	
Phase 1 & 2 Area															
7948 Andorick Drive	RW-7948AND-060617	6/6/17	5 U	0.5 U	0.36 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
7921 Barnhill Circle	RW-7921BHC-060617	6/6/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.2	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-7921BHC-060617-F	6/6/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.4	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-7921BHC-100917	10/9/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.5	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-7921BHC-100917-F	10/9/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.5	0.5 U	0.5 U	0.5 U	0.4 U	
1218 Old Camp Meade	RW-1218OCM-060617	6/6/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.79	0.5 U	0.5 U	0.5 U	0.4 U	
1221 Old Camp Meade	RW-1221OCM-062217	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.86	0.5 U	0.5 U	0.5 U	0.24 J	
839 Reece Road	RW-839RR-062217	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.5	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-839RR-062217-F	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.6	0.5 U	0.5 U	0.5 U	0.4 U	
847 Reece Road	RW-847RR-062217	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.3	0.5 U	0.5 U	0.5 U	0.34 J	
853 Reece Road	RW-853RR-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.38 J	0.5 U	0.5 U	2.5	0.5 U	0.5 U	0.5 U	0.4 U	
907 Reece Road	RW-907REE-060617	6/6/17	5 U	0.5 U	0.5 U	0.5 U	0.35 J	0.5 U	0.5 U	1.6	0.5 U	0.5 U	0.5 U	0.19 J	
	RW-907REE-060617-F	6/6/17	5 U	0.5 U	0.5 U	0.5 U	0.35 J	0.5 U	0.5 U	1.6	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-907REE-10182017	10/18/17	5 U	0.5 U	0.5 U	0.5 U	0.49 J	0.5 U	0.5 U	2.3	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-907REE-10182017-F	10/18/17	5 U	0.5 U	0.5 U	0.5 U	0.38 J	0.5 U	0.5 U	2.0	0.5 U	0.5 U	0.5 U	0.4 U	
7763 Ricker Road	RW-7763RICK-080817	8/8/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1408 Pride Tree Circle	RW-1408PTC-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1217 Scattered Pines Court	RW-1217SPC-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.20 J	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1217SPC-101017-F	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.5 U	0.5 U	0.5 U	0.4 U	
1216 Scattered Pines Court	RW-1216SPC-080917	8/9/17	5 U	0.47 J	0.41 J	0.44 J	0.5 U	0.5 U	0.5 U	0.096 J	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1216SPC-080917-F	8/9/17	5 U	0.65	0.74	0.66	0.5 U	0.5 U	0.5 U	0.092 J	0.5 U	0.5 U	0.5 U	0.4 U	
1218 Scattered Pines Court	RW-1218SPC-062217	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1218SPC-062217-F	6/22/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.11 J	0.5 U	0.5 U	0.5 U	0.4 U	
1201 Severn Station Road	RW-1201SSTA-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1201SSTA-101017-F	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	0.4 U	
1210 Severn Station Road	RW-1210SSTA-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1213 Severn Station Road	RW-1213SSR-110217	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.37 J	0.5 U	0.5 U	0.5 U	0.4 U	
1214 Severn Station Road	RW-1214SSTA-080817	8/8/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.33 J	0.5 U	0.5 U	0.5 U	0.4 U	
1337 Severn Station Road	RW-1337SSTA-080917	8/9/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.28 J	0.5 U	0.5 U	0.5 U	0.4 U	
Phase 4 Area															
1317 Light Pines Court	RW-1319LP-092517	9/25/17	5 U	0.5 U	0.42 J	0.5 U	0.5 U	0.5 U	0.47 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1317LP-092517-F	9/25/17	5 U	0.5 U	0.36 J	0.5 U	0.5 U	0.5 U	0.37 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1319 Light Pines Court	RW-1319LP-092517	9/25/17	5 U	0.5 U	0.36 J	0.5 U	0.5 U	0.5 U	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1320 Light Pines Court	RW-1320LP-071117	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1320LP-071117-F	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1323 Light Pines Court	RW-1323LP-080817	8/8/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J	
	RW-1323LP-080817-F	8/8/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.23 J	
1213 Pine Cone Court	RW-1213PCC-071117	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1213PCC-071117-F	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1221 Pine Cone Court	RW-1221PCC-062117	6/21/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	0.4 U	
	RW-1221PCC-062117-F	6/21/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.095 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U	
1226 Pine Cone Court	RW-1226PCC-071117	7/7/17	5 U	0.5 U	0.5 U										

Table 1

Residential Well Sampling Results
Former Kop-Flex Facility Site
June 2017 through September 2017

Address	Sample ID	Sampling Date	Parameter:	Acetone	Bromoform	Chloroform	Dibromochloromethane	1,2-Dichloroethane	1,1-Dichloroethylene	Methyl Tert Butyl Ether	1,1,1-Trichloroethane	Tetrachloroethylene	Trichloroethylene	1,4-Dioxane
			Units:	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
		Groundwater Standard:	550 (a)	80 (a)	80 (a)	80 (a)	5	7	20 (a)	200	5	5	5	6.7 (b)
1233 Pine Cone Court	RW-1233PCC-062617	6/23/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J
	RW-1233PCC-062617-F	6/23/17	3.9 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.27 J
1306 Redbridge Drive	RW-1306RB-062117	6/21/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.50	0.5 U	0.5 U	0.5 U	0.5 U	0.49
	RW-1306RB-062117-F	6/21/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.43 J	0.5 U	0.5 U	0.5 U	0.5 U	0.46
1307 Redbridge Drive	RW-1307RD110217	11/2/17	5 U	0.5 U	0.35 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
1308 Redbridge Drive	RW-1308RB-092517	9/25/17	5 U	0.5 U	0.39 J	0.5 U	0.5 U	0.5 U	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.53
	RW-1308RB-092517-F	9/25/17	5 U	0.5 U	0.34 J	0.5 U	0.5 U	0.5 U	0.43 J	0.5 U	0.5 U	0.5 U	0.5 U	0.55
901 Redmore Drive	RW-901RD-110217	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 J	0.5 U	0.5 U	0.5 U	0.5 U	0.44
	RW-901RD-110217-F	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.42
902 Redmore Drive	RW-902RMD-071117	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.37 J	0.5 U	0.5 U	0.5 U	0.5 U	0.25 J
	RW-902RMD-071117-F	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.36 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
915 Redmore Drive	RW-915RMD-062117	6/21/17	4.10 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.15 J	0.5 U	0.5 U	0.5 U	0.5 U	0.19 J
	RW-915RMD-062117-F	6/21/17	5 U	0.5 U	0.46 J	0.19 J	0.5 U	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	0.5 U	0.2 J
916 Redmore Drive	RW-916RMC-062317	6/23/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.29 J	0.5 U	0.5 U	0.5 U	0.5 U	0.92
919 Redmore Drive	RW-919RD-101017	10/10/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.15 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
	RW-919RD-101017-F	10/10/17	5.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
	RW-919RD-110217	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
	RW-919RD-110217-F	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
920 Redmore Drive	RW-920RMD-071117	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.097 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
	RW-920RMD-071117-F	7/7/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.097 J	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
921 Redmore Drive	RW-921RD100217	11/2/17	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
1307 Redmore Court	RW-1307RMC-062217	6/22/17	5 U	0.5 U	0.39 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U
	RW-1307RMC-062217-F	6/22/17	5 U	0.5 U	0.42 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 U

Notes:

(a) Maryland Department of Environment Action Level

(b) Maryland Risk Based Level

(c) MCL - US Environmental Protection Agency Maximum Contaminant Level

U - Undetected, value reported is the laboratory reporting limit

J = Indicates an estimated value between method detection limit and reporting limit

For homes where two samples were collected, the sample with the "F" at the end of the ID is the post-treatment sample

and the other is the pre-treatment sample.

Table 2

Historical Water Sampling Results
Residential Well - 1227 Old Camp Meade Road
Former Kop-Flex Facility Site
Hanover, Maryland

Parameter Units MCL	Acetone µg/l 550 (a)	Bromoform µg/l 80 (a)	Carbon Disulfide µg/l 100 (a)	Chloroform µg/l 80 (a)	1,1-Dichloroethane µg/l 90 (a)	1,1-Dichloroethene µg/l 7	Methyl Tert Butyl Ether µg/l 20 (a)	Toluene µg/l 1,000	1,1,1-Trichloroethane µg/l 200	1,4-Dioxane µg/l 4.6 (b)
Sample Type	Date									
Pre-Treatment	2/13/2013	5 U	0.5 U	0.18 J	0.5 U	0.5 U	0.25 J	0.18 J	0.091 J	2 U
Post-Treatment	2/13/2013	5 U	0.5 U	0.5 U	0.2 J	0.5 U	0.5 U	0.5 U	0.081 J	2 U
Pre-Treatment	7/9/2013	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.11 J	2.3
Pre-Treatment	2/12/2014	5 U	0.5 U	0.5 U	0.5 U	0.15 J	0.5 U	0.5 U	0.5 U	2 U
Pre-Treatment	5/29/2014	5 U	0.5 U	0.5 U	0.5 U	0.051 J	1.3	0.5 U	0.15 J	2 U
Post-Treatment	5/29/2014	5 U	0.5 U	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	0.15 J	2 U
Pre-Treatment	9/12/2014	5 U	0.5 U	0.5 U	0.5 U	0.5 U	2	0.5 U	0.21 J	2 U
Post-Treatment	9/12/2014	5 U	0.28 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J	2 U
Pre-Treatment	12/8/2014	0.99 J	0.5 U	0.5 U	0.5 U	0.5 U	0.43 J	0.5 U	0.20 J	2 U
Post-Treatment	12/8/2014	5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.4	0.5 U	0.24 J	2 U
Pre-Treatment	11/3/2016	5 U	0.5 U	0.5 U	0.5 U	0.19 J	8.8	0.5 U	0.48 J	2.9
Post-Treatment	11/3/2016	5 U	0.5 U	0.5 U	0.095 J	0.16 J	0.5 U	0.5 U	0.42 J	2.7
Post-Treatment	3/28/2017	5 U	0.5 U	0.5 U	0.5 U	0.17 J	0.5 U	0.5 U	0.41 J	3.4
Pre-Treatment	7/25/2017	5 U	0.5 U	0.5 U	0.5 U	0.15 J	6.7	0.5 U	0.33 J	3.8
Post-Treatment	7/25/2017	5 U	0.55	0.5 U	0.5 U	0.19 J	0.5 U	0.5 U	0.42 J	3.1
Pre-Treatment	9/25/2017	5 U	0.5 U	0.5 U	0.5 U	0.18 J	7.8	0.5 U	0.41 J	4.6
Post-Treatment	9/25/2017	5 U	0.5 U	0.5 U	0.5 U	0.15 J	1.7	0.5 U	0.37 J	3.5
Pre-Treatment	10/30/2017	5 U	0.5 U	0.5 U	0.5 U	0.24 J	11.5	0.5 U	0.5	2.6
Post-Treatment	10/30/2017	5 U	0.5 U	0.5 U	0.5 U	0.23 J	0.5 U	0.5 U	0.53	2.6
Pre-Treatment	11/30/2017	5 U	0.5 U	0.5 U	0.5 U	0.16 J	6	0.5 U	0.3 J	2.3
Post-Treatment	11/30/2017	5 U	0.5 U	0.5 U	0.5 U	0.17 J	1.9	0.5 U	0.34 J	2.4
Pre-Treatment	12/15/2017	5 U	0.5 U	0.5 U	0.5 U	0.5 U	7	0.5 U	0.36 J	2.0
Post-Treatment	12/15/2017	5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.8	0.5 U	0.39 J	2.1

(a) Maryland Department of Environment Action Level

(b) Maryland Risk Based Action Level

Notes:

MCL - US Environmental Protection Agency Maximum Contaminant Level

U - Undetected, value reported is the laboratory reporting limit

J = Indicates an estimated value between method detection limit and reporting limit

Bold value indicates concentration above the comparative criterion.

Table 3

Quarterly Offsite Monitoring Well Sample Results
Former Kop-Flex Facility Site
Hanover, Maryland
November 2017

Parameters (a)	UNCONFINED ZONE										CONFINED ZONE				
	Well ID:	MW-25	MW-28	MW-24D	MW-2400 (d)	MW-25D-130	MW-25D-190	MW-2500 (e)	MW-28D	MW-31D	MW-33D-235	MW-33D-295	MW-35D		
		Sampling Date:	14-Nov-17		14-Nov-17	14-Nov-17	14-Nov-17		14-Nov-17		14-Nov-17	14-Nov-17	14-Nov-17	14-Nov-17	
Benzene	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.78	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Methyl tert-butyl ether	20 (c)	1.21	1.0 U	0.97 J	1.0 U	1.0 U	1.07	1.17	1.0 U	1.0 U	0.94 J	0.96 J	1.0 U	1.0 U	
Chloroform	80	5.0 U	5.0 U	0.43 J	0.59 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	
1,1-Dichloroethane	90	1.0 U	1.0 U	28.1	38.5	5.12	13.6	16.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichloroethane	5	1.0 U	1.0 U	3.43	4.53	1.25	0.67 J	0.82 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
1,1-Dichloroethene	7	1.0 U	1.0 U	803	983	151	67.2	71.4	5.55	1.0 U	1.0 U	3.4	1.0 U	1.0 U	
1,4-Dioxane	4.6 (c)	2.0 U	2.0 U	212	227	58.5	56.7	61	3.5	2.0 U	4.3	9.7	2.0 U	2.0 U	
1,1,1-Trichloroethane	200	1.0 U	1.0 U	10.5	16.8	6.42	13.6	13.9	1.0 U	1.0 U	1.0 U	0.49 J	1.0 U	1.0 U	
1,1,2-Trichloroethane	5	1.0 U	1.0 U	0.52 J	0.76 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Methylene Chloride	5	11.7	5.0 U	11.7	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	12.0	11.5	5.0 U	5.0 U	
Trichloroethene	5	1.0 U	1.0 U	5.85	10.2	1.06	1.0 U	0.40 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
cis-1,2-Dichloroethene	70	1.0 U	1.0 U	2.28	3.20	0.57 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	
Vinyl Chloride	2	1.0 U	1.0 U	1.0 U	1.0 U	0.34 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	

a/ U = not detected above the method detection limit; J = reported value is an estimated concentration.

Bolded values indicate an exceedance of the Groundwater Quality Standards

All sample concentrations in micrograms per liter ($\mu\text{g/l}$)

b/ Source: [http://www.mde.maryland.gov/assets/document/Final%20Update%20No%202.1%20dated%205-20-08\(1\).pdf](http://www.mde.maryland.gov/assets/document/Final%20Update%20No%202.1%20dated%205-20-08(1).pdf)

c/ Value represents the new MDE risk-based action level. The previous value was 6.7 $\mu\text{g/l}$.

d/ Field duplicate of sample from MW-24D.

e/ Field duplicate of sample from well MW-25-190.

Table 4

Historical Offsite Groundwater Sampling Results
Former Kop-Flex Facility Site
Hanover, Maryland
2015 to Present

Well ID	Groundwater Quality Standard (µg/L)	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	1,4-Dioxane	Methylene Chloride	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl chloride
		3.6	90	5	7	70	4.6	5	200	5	5	2
Unconfined Zone Wells												
MW-25												
	3/19/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/24/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/23/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/6/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/23/2016	1.0 U	1.0 U	1.0 U	1.5	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/20/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	11.7	1.0 U	1.0 U	1.0 U	1.0 U
MW-28												
	3/17/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/23/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/22/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/5/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/22/2016	1.0 U	1.0 U	1.0 U	6.2	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/19/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/7/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 4

Historical Offsite Groundwater Sampling Results
Former Kop-Flex Facility Site
Hanover, Maryland
2015 to Present

Well ID	Groundwater Quality Standard (µg/L)	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	1,4-Dioxane	Methylene Chloride	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl chloride
MW-45	3/24/2017	3.6	90	5	7	70	4.6	5	200	5	5	2
Confined Zone Wells												
MW-24D	6/19/2015 3/22/2016 7/20/2016 12/8/2016 5/2/2017 8/31/2017 11/14/2017	20.0 U 12.5 U 12.5 U 5.0 U 5.0 U 5.0 U 5.0 U	92.5 88.0 95.8 5.2 40.4 5.2 28.1	20.0 U 15.7 13.9 5.2 5.6 5.2 3.4	2,100 1780 1970 701 830 663 803	20.0 U 12.5 U 8.1 J 5.0 U 5.0 U 5.0 U 2.3	728 561 492 192 216 199 212	40.0 U 39.4 22.6 J 10.0 U 10.0 U 10.0 U 11.7	53.3 38.6 39.2 9.0 5.0 U 5.0 U 10.5	20.0 U 12.5 U 12.5 U 5.0 U 5.0 U 5.0 U 0.52 J	20.0 U 12.5 U 11.9 J 5.0 U 5.0 U 5.0 U 5.9	20.0 U 12.5 U 12.5 U 5.0 U 5.0 U 5.0 U 1.0 U
MW-25D-130	3/19/2015 6/24/2015 9/23/2015 1/7/2016 3/23/2016 7/19/2016 9/9/2016 12/8/2016 2/21/2017 5/2/2017 8/31/2017 11/14/2017	10.0 U 1.0 U 10.0 U 5.0 U 5.0 U 10.0 U 5.0 U 1.0 U 1.0 U 2.0 U 2.0 U 2.0 U	38.6 37.1 29.7 33.4 24.5 39.3 27.9 6.7 7.2 6.5 7.4 5.1	10.8 8.9 9.7 9.7 8.0 10.2 6.4 1.5 1.7 2.0 U 1.7 1.3	854 1,030 697 800 676 1,090 661 171 194 174 193 151	10.0 U 4.6 10.0 U 5.0 U 5.0 U 4.9 J 5.0 U 1.0 U 1.0 U 2.0 U 2.0 U 0.57 J	446 303 295 398 302 367 241 13.6 69.1 61.0 57.9 58.5	200 U 2.0 U 20.0 U 10.0 U 10.0 U 14.3 J 12.0 2.0 U 2.0 U 4.0 U 4.0 U 5.0 U	8,930 46.3 32.3 5.0 U 26.2 37.0 25.0 6.9 7.0 5.0 6.9 6.4	100 U 1.2 10.0 U 5.0 U 5.0 U 37.0 5.0 U 1.0 U 1.0 U 2.0 U 2.0 U 1.0 U	100 U 6.8 14.2 6.1 5.0 U 6.5 J 5.0 U 1.0 U 1.0 U 2.0 U 2.0 U 1.1	100 U 1.0 U 10.0 U 5.0 U 5.0 U 10.0 U 5.0 U 1.0 U 1.0 U 2.0 U 2.0 U 1.0 U
MW-25D-192	3/19/2015 6/25/2015 9/22/2015 1/7/2016 3/23/2016 7/20/2016 9/8/2016 12/8/2016 2/21/2017 5/2/2017 8/31/2017 11/14/2017	1.0 U 1.0 U 5.0 U	11.7 11.9 13.9 11.7 10.3 11.7 12.9 16.1 14.0 16.9 15.7 13.6	1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 0.73 J 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 0.67 J	53.0 59.4 51.4 47.2 43.3 54.9 56.8 64.6 63.3 81.0 62.5 67.2	1.0 U 1.0 U	49.4 39.8 45.0 41.7 42.2 54.4 39.3 51.3 52.1 53.1 44.3 56.7	2.0 U 2.0 U 5.0 U	13.7 14.2 12.9 12.5 11.3 11.1 12.6 13.3 11.6 13.5 13.1 13.6	1.0 U 1.0 U	1.0 U 1.0 U 1.3 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U 1.0 U	1.0 U 1.0 U

Table 4

Historical Offsite Groundwater Sampling Results
Former Kop-Flex Facility Site
Hanover, Maryland
2015 to Present

Well ID	Groundwater Quality Standard (µg/L)	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	1,4-Dioxane	Methylene Chloride	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl chloride
		3.6	90	5	7	70	4.6	5	200	5	5	2
MW-28D	3/17/2015	1.0 U	1.0 U	1.0 U	10.6	1.0 U	5.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/23/2015	1.0 U	1.0 U	1.0 U	12.8	1.0 U	4.5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/22/2015	1.0 U	1.0 U	1.0 U	14.3	1.0 U	4.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/5/2016	1.0 U	1.0 U	1.0 U	11.5	1.0 U	5.5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/23/2016	1.0 U	1.0 U	1.0 U	9.1	1.0 U	4.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/19/2016	1.0 U	1.0 U	0.25 J	10.1	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/7/2016	1.0 U	1.0 U	1.0 U	12.0	1.0 U	5.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	6.3	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	4.6	1.0 U	3.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	5.8	1.0 U	2.7	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	5.0	1.0 U	2.7	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	5.5	1.0 U	3.5	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-31D	3/17/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/24/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/22/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/6/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/21/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/19/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/6/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Table 4

Historical Offsite Groundwater Sampling Results
Former Kop-Flex Facility Site
Hanover, Maryland
2015 to Present

Well ID	Groundwater Quality Standard (µg/L)	Chloroethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	1,4-Dioxane	Methylene Chloride	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl chloride
		3.6	90	5	7	70	4.6	5	200	5	5	2
MW-33D-235	3/18/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/23/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/21/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/4/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/21/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/18/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/7/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.3	12.0	1.0 U	1.0 U	1.0 U	1.0 U
MW-33D-295	3/18/2015	1.0 U	1.0 U	1.0 U	4.6	1.0 U	8.0	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/23/2015	1.0 U	1.0 U	1.0 U	3.3	1.0 U	6.8	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/21/2015	1.0 U	1.0 U	1.0 U	4.8	1.0 U	6.8	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/4/2016	1.0 U	1.0 U	1.0 U	3.7	1.0 U	7.6	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	3/21/2016	1.0 U	1.0 U	1.0 U	3.9	1.0 U	7.8	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/18/2016	1.0 U	1.0 U	0.36 J	3.2	1.0 U	5.1	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/7/2016	1.0 U	1.0 U	1.0 U	3.8	1.0 U	7.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	5.4	1.0 U	7.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	4.0	1.0 U	6.8	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	5.3	1.0 U	7.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	5.6	1.0 U	6.3	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	3.4	1.0 U	9.7	11.5	0.49 J	1.0 U	1.0 U	1.0 U
MW-35D	3/18/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/22/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/21/2015	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	1/6/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	4/15/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/18/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	9/6/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	12/8/2016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	2/21/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	5/2/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	8/31/2017	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/14/2017	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U

a/ U = not detected above the method detection limit.

Bolded values indicate an exceedance of the Groundwater Quality Standards

All sample concentrations in micrograms per liter (µg/l)

**ENCLOSURE A – LABORATORY ANALYTICAL REPORTS FOR RESIDENTIAL
WELL SAMPLES, PHASE 1 & 2 AREA RE-SAMPLING AND
PHASE 4 AREA (JULY 2017 THROUGH SEPTEMBER 2017)**



ACCUTEST

New Jersey

10/26/17

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e-Hardcopy 2.0
Automated Report

Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

SGS Accutest Job Number: JC52931

Sampling Dates: 10/09/17 - 10/10/17

Report to:

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11190 Sunrise Valley Drive Suite 300
Reston, VA 20190
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ATTN: Eric Johnson

Total number of pages in report: 102



Test results contained within this data package meet the requirements
of the National Environmental Laboratory Accreditation Program
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Nancy F. Cole

**Nancy Cole
Laboratory Director**

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Sample Summary

WSP Environment & Energy

Job No: JC52931

Kop-Flex, Hanover, VA

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC52931-1	10/10/17	17:05	BF/MK	10/11/17 AQ	Trip Blank Water TB-101017
JC52931-2	10/09/17	14:00	BF/MK	10/11/17 AQ	Water RW-1210SSTA
JC52931-3	10/09/17	15:40	BF/MK	10/11/17 AQ	Water RW-7921BHC-100917-F
JC52931-4	10/09/17	15:25	BF/MK	10/11/17 AQ	Water RW-7921BHC-100917
JC52931-5	10/09/17	12:00	BF/MK	10/11/17 AQ	Water RW-100
JC52931-6	10/09/17	16:00	BF/MK	10/11/17 AQ	Water RW-1210SSTA-100917
JC52931-7	10/10/17	09:00	BF/MK	10/11/17 AQ	Water RW-919RMD-101017
JC52931-8	10/10/17	09:10	BF/MK	10/11/17 AQ	Water RW-919RMD-101017-F
JC52931-9	10/10/17	11:05	BF/MK	10/11/17 AQ	Water RW-853RR--101017
JC52931-10	10/10/17	09:35	BF/MK	10/11/17 AQ	Water RW-200
JC52931-11	10/10/17	12:32	BF/MK	10/11/17 AQ	Water RW-1408PTC-101017
JC52931-12	10/10/17	15:18	BF/MK	10/11/17 AQ	Water RW-1217SPC-101017
JC52931-13	10/10/17	15:30	BF/MK	10/11/17 AQ	Water RW-1217SPC-101017-F



Sample Summary (continued)

WSP Environment & Energy

Job No: JC52931

Kop-Flex, Hanover, VA

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC52931-14	10/10/17	16:45	BF/MK	10/11/17 AQ	Water RW-1201SSTA-101017
JC52931-15	10/10/17	17:05	BF/MK	10/11/17 AQ	Water RW-1201SSTA-101017-F

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: WSP Environment & Energy

Job No JC52931

Site: Kop-Flex, Hanover, VA

Report Date 10/26/2017 2:42:52 P

On 10/11/2017, 14 Sample(s), 1 Trip Blank(s) and 0 Field Blank(s) were received at SGS Accutest at a maximum corrected temperature of 0.6 C. Samples were intact and chemically preserved, unless noted below. A SGS Accutest Job Number of JC52931 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method EPA 524.2 REV 4.1

Matrix: AQ	Batch ID: V1B5347
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC52931-2MS, JC52931-3DUP were used as the QC samples indicated.
- RPD(s) for Duplicate for Methyl Tert Butyl Ether are outside control limits for sample JC52931-3DUP.
- JC52931-11: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-10: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-9: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-12: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-13: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-14: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-5: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-8: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-7: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-2: EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.
- JC52931-3: EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.
- JC52931-4: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-1: EPA 524.2 is not a certified method for non-potable water samples.

Matrix: AQ	Batch ID: V1B5351
-------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) JC52982-1DUP, JC53135-1MS were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for Carbon disulfide, Methylene chloride are outside control limits. High percent recoveries and no associated positive reported in the QC batch.
- Matrix Spike Recovery(s) for Carbon disulfide are outside control limits.
- JC52931-15: EPA 524.2 is not a certified method for non-potable water samples.
- JC52931-15 for Methylene chloride: This compound in BS is outside in house QC limits bias high.
- JC52931-15 for Carbon disulfide: This compound in BS is outside in house QC limits bias high.

Volatiles by GCMS By Method SW846 8260C BY SIM**Matrix:** AQ**Batch ID:** V3A6794

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC52931-11MS, JC52931-6DUP were used as the QC samples indicated.

SGS Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS Accutest is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS Accutest indicated via signature on the report cover

Summary of Hits

Job Number: JC52931
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 10/09/17 thru 10/10/17

C3

Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	RL	MDL	Units	Method
---------------	------------------	--------------------	------	----	-----	-------	--------

JC52931-1 TB-101017**No hits reported in this sample.****JC52931-2 RW-1210SSTA****No hits reported in this sample.****JC52931-3 RW-7921BHC-100917-F**

Methyl Tert Butyl Ether ^a	4.5	0.50	0.080	ug/l	EPA 524.2 REV 4.1
--------------------------------------	-----	------	-------	------	-------------------

JC52931-4 RW-7921BHC-100917

Methyl Tert Butyl Ether ^b	4.5	0.50	0.080	ug/l	EPA 524.2 REV 4.1
--------------------------------------	-----	------	-------	------	-------------------

JC52931-5 RW-100

Methyl Tert Butyl Ether ^b	5.0	0.50	0.080	ug/l	EPA 524.2 REV 4.1
--------------------------------------	-----	------	-------	------	-------------------

JC52931-6 RW-1210SSTA-100917**No hits reported in this sample.****JC52931-7 RW-919RMD-101017**

Methyl Tert Butyl Ether ^b	0.15 J	0.50	0.080	ug/l	EPA 524.2 REV 4.1
--------------------------------------	--------	------	-------	------	-------------------

JC52931-8 RW-919RMD-101017-F

Acetone ^b	5.2	5.0	3.8	ug/l	EPA 524.2 REV 4.1
1,2-Dichloropropane ^b	6.5	0.50	0.29	ug/l	EPA 524.2 REV 4.1

JC52931-9 RW-853RR--101017

1,2-Dichloroethane ^b	0.38 J	0.50	0.28	ug/l	EPA 524.2 REV 4.1
Methyl Tert Butyl Ether ^b	2.5	0.50	0.080	ug/l	EPA 524.2 REV 4.1

JC52931-10 RW-200

1,2-Dichloroethane ^b	0.44 J	0.50	0.28	ug/l	EPA 524.2 REV 4.1
Methyl Tert Butyl Ether ^b	2.8	0.50	0.080	ug/l	EPA 524.2 REV 4.1

Summary of Hits

Job Number: JC52931
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 10/09/17 thru 10/10/17

3

Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	RL	MDL	Units	Method
---------------	------------------	--------------------	------	----	-----	-------	--------

JC52931-11 RW-1408PTC-101017

No hits reported in this sample.

JC52931-12 RW-1217SPC-101017

Methyl Tert Butyl Ether ^b 0.20 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

JC52931-13 RW-1217SPC-101017-F

Methyl Tert Butyl Ether ^b 0.22 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

JC52931-14 RW-1201SSTA-101017

Methyl Tert Butyl Ether ^b 0.16 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

JC52931-15 RW-1201SSTA-101017-F

Methyl Tert Butyl Ether ^b 0.12 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

(a) EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.

(b) EPA 524.2 is not a certified method for non-potable water samples.



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Section 4

4

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 3

Client Sample ID: TB-101017
Lab Sample ID: JC52931-1
Matrix: AQ - Trip Blank Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112110.D	1	10/12/17 12:07	BK	n/a	n/a	V1B5347

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-101017	Date Sampled:	10/10/17
Lab Sample ID:	JC52931-1	Date Received:	10/11/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	93%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	TB-101017	Date Sampled:	10/10/17
Lab Sample ID:	JC52931-1	Date Received:	10/11/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: TB-101017
Lab Sample ID: JC52931-1
Matrix: AQ - Trip Blank Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157850.D	1	10/12/17 19:31	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	112%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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4.2
4

Client Sample ID:	RW-1210SSTA	Date Sampled:	10/09/17
Lab Sample ID:	JC52931-2	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1B112111.D	1	10/12/17 12:38	BK	n/a	n/a	V1B5347

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.2
4

Client Sample ID:	RW-1210SSTA	Date Sampled:	10/09/17
Lab Sample ID:	JC52931-2	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1210SSTA

Lab Sample ID: JC52931-2

Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/09/17

Date Received: 10/11/17

Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.3
4

Client Sample ID: RW-7921BHC-100917-F

Lab Sample ID: JC52931-3

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112112.D	1	10/12/17 13:10	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.3

4

Client Sample ID:	RW-7921BHC-100917-F	Date Sampled:	10/09/17
Lab Sample ID:	JC52931-3	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	4.5	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	94%		70-130%
460-00-4	4-Bromofluorobenzene	84%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID: RW-7921BHC-100917-F
Lab Sample ID: JC52931-3
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/09/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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4.3
4

Client Sample ID: RW-7921BHC-100917-F

Lab Sample ID: JC52931-3

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157843.D	1	10/12/17 16:56	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	110%		51-175%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 3

Client Sample ID: RW-7921BHC-100917

Lab Sample ID: JC52931-4

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112113.D	1	10/12/17 13:42	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID: RW-7921BHC-100917

Lab Sample ID: JC52931-4

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	4.5	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	93%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-7921BHC-100917**Lab Sample ID:** JC52931-4**Matrix:** AQ - Water**Method:** EPA 524.2 REV 4.1**Project:** Kop-Flex, Hanover, VA**Date Sampled:** 10/09/17**Date Received:** 10/11/17**Percent Solids:** n/a**VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit**RL = Reporting Limit****E = Indicates value exceeds calibration range****J = Indicates an estimated value****B = Indicates analyte found in associated method blank****N = Indicates presumptive evidence of a compound**

Report of Analysis

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Client Sample ID: RW-7921BHC-100917

Lab Sample ID: JC52931-4

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157844.D	1	10/12/17 17:21	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	112%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.5

4

Client Sample ID: RW-100
Lab Sample ID: JC52931-5
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/09/17
Date Received: 10/11/17
Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112117.D	1	10/12/17 15:52	BK	n/a	n/a	V1B5347

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	RW-100	Date Sampled:	10/09/17
Lab Sample ID:	JC52931-5	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	5.0	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-100	Date Sampled:	10/09/17
Lab Sample ID:	JC52931-5	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-100
Lab Sample ID: JC52931-5
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/09/17

Date Received: 10/11/17

Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157845.D	1	10/12/17 17:47	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	110%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1210SSTA-100917

Lab Sample ID: JC52931-6

Date Sampled: 10/09/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157841.D	1	10/12/17 16:04	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	110%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-919RMD-101017
 Lab Sample ID: JC52931-7
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
 Date Received: 10/11/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112118.D	1	10/12/17 16:23	BK	n/a	n/a	V1B5347

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-919RMD-101017
 Lab Sample ID: JC52931-7
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
 Date Received: 10/11/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.15	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	94%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-919RMD-101017
Lab Sample ID: JC52931-7
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: RW-919RMD-101017

Lab Sample ID: JC52931-7

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157847.D	1	10/12/17 18:13	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	109%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.8

4

Client Sample ID: RW-919RMD-101017-F

Lab Sample ID: JC52931-8

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112119.D	1	10/12/17 16:55	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	5.2	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	6.5	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-919RMD-101017-F

Lab Sample ID: JC52931-8

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	93%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID: RW-919RMD-101017-F
Lab Sample ID: JC52931-8
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: RW-919RMD-101017-F

Lab Sample ID: JC52931-8

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157855.D	1	10/12/17 21:39	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	115%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-853RR--101017
 Lab Sample ID: JC52931-9
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
 Date Received: 10/11/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112120.D	1	10/12/17 17:27	BK	n/a	n/a	V1B5347

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	0.38	0.50	0.28	ug/l	J
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID: RW-853RR--101017
 Lab Sample ID: JC52931-9
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
 Date Received: 10/11/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	2.5	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	93%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-853RR--101017
Lab Sample ID: JC52931-9
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-853RR--101017
Lab Sample ID: JC52931-9
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157848.D	1	10/12/17 18:39	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	119%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-200
Lab Sample ID: JC52931-10
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112121.D	1	10/12/17 17:59	BK	n/a	n/a	V1B5347

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	0.44	0.50	0.28	ug/l	J
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Report of Analysis

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Client Sample ID:	RW-200	Date Sampled:	10/10/17
Lab Sample ID:	JC52931-10	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	2.8	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	79%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Report of Analysis

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Client Sample ID:	RW-200	Date Sampled:	10/10/17
Lab Sample ID:	JC52931-10	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-200
Lab Sample ID: JC52931-10
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157849.D	1	10/12/17 19:05	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	116%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1408PTC-101017

Lab Sample ID: JC52931-11

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112122.D	1	10/12/17 18:30	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.11

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Report of Analysis

Client Sample ID: RW-1408PTC-101017
Lab Sample ID: JC52931-11
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Report of Analysis

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Client Sample ID: RW-1408PTC-101017

Lab Sample ID: JC52931-11

Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17

Date Received: 10/11/17

Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.11

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Report of Analysis

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Client Sample ID: RW-1408PTC-101017

Lab Sample ID: JC52931-11

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157842.D	1	10/12/17 16:30	PR	n/a	n/a	V3A6794
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	100%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.11

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Report of Analysis

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Client Sample ID: RW-1217SPC-101017

Lab Sample ID: JC52931-12

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112123.D	1	10/12/17 19:03	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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4.12
4

Client Sample ID: RW-1217SPC-101017

Lab Sample ID: JC52931-12

Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17

Date Received: 10/11/17

Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.20	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1217SPC-101017
Lab Sample ID: JC52931-12
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1217SPC-101017

Lab Sample ID: JC52931-12

Matrix: AQ - Water

Method: SW846 8260C BY SIM

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17

Date Received: 10/11/17

Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157851.D	1	10/12/17 19:57	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	115%		51-175%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1217SPC-101017-F

Lab Sample ID: JC52931-13

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112124.D	1	10/12/17 19:35	BK	n/a	n/a	V1B5347

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1217SPC-101017-F	Date Sampled:	10/10/17
Lab Sample ID:	JC52931-13	Date Received:	10/11/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.22	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%		70-130%
460-00-4	4-Bromofluorobenzene	80%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1217SPC-101017-F
Lab Sample ID: JC52931-13
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1217SPC-101017-F

Lab Sample ID: JC52931-13

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157852.D	1	10/12/17 20:22	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	115%		51-175%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1201SSTA-101017

Lab Sample ID: JC52931-14

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112125.D	1	10/12/17 20:07	BK	n/a	n/a	V1B5347

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.14

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Report of Analysis

Client Sample ID: RW-1201SSTA-101017

Lab Sample ID: JC52931-14

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.16	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	89%		70-130%
460-00-4	4-Bromofluorobenzene	77%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Report of Analysis

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Client Sample ID: RW-1201SSTA-101017
Lab Sample ID: JC52931-14
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17
Date Received: 10/11/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1201SSTA-101017

Lab Sample ID: JC52931-14

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157853.D	1	10/12/17 20:48	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	115%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Report of Analysis

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Client Sample ID: RW-1201SSTA-101017-F

Lab Sample ID: JC52931-15

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112160.D	1	10/16/17 15:38	BK	n/a	n/a	V1B5351

Purge Volume	
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide ^b	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-1201SSTA-101017-F

Lab Sample ID: JC52931-15

Matrix: AQ - Water

Method: EPA 524.2 REV 4.1

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/10/17

Date Received: 10/11/17

Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride b	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.12	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	94%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID: RW-1201SSTA-101017-F**Lab Sample ID:** JC52931-15**Matrix:** AQ - Water**Method:** EPA 524.2 REV 4.1**Project:** Kop-Flex, Hanover, VA**Date Sampled:** 10/10/17**Date Received:** 10/11/17**Percent Solids:** n/a**VOA List**

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

(b) This compound in BS is outside in house QC limits bias high.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.15

4

Report of Analysis

Page 1 of 1

Client Sample ID: RW-1201SSTA-101017-F

Lab Sample ID: JC52931-15

Date Sampled: 10/10/17

Matrix: AQ - Water

Date Received: 10/11/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157854.D	1	10/12/17 21:13	PR	n/a	n/a	V3A6794
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



ACCU TEST

WTP

CHAIN OF CUSTODY

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

PAGE 1 OF 2

JCSZ931

Client / Reporting Information		Project Information				Requested Analysis (see TEST CODE sheet)				Matrix Codes						
Company Name WSP		Project Name: KopFlex Residential														
Street Address 13530 Dulles Technology Dr.		Street Sp 300		Billing Information (If different from Report to)						DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank						
City Herndon	State VA	Zip 20171	City Hanover	State MD	Company Name											
Project Contact Eric Johnson		E-mail Eric.Johnson@WSP		Project # 3140038913	Street Address											
Phone # 703 709 6500		Fax #		Client Purchase Order #		City	State	Zip								
Sampler(s) Name(s) Ben Foster Maria Kaplan		Phone #		Project Manager		Attention:										
SGS Accident Sample #	Field ID / Point of Collection	Collection				Number of preserved Bottles										
		MEOH/DI/Vial #	Date	Time	Sampled by (DWS)	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE		
1	TB-101017	1	—	—	4	X								VOCs (EPA 524)	X X	VII32
2	RW-12105STA	10/9/17	1400	10/9/17	1400	X	X							1,4-Dioxane (8260 SIM)	X X	VII31
3	RW-7921BAC-100917-F	10/9/17	1540	10/9/17	1540	X	X								X X	
4	RW-7921BHC-100917	10/9/17	1525	10/9/17	1525	X	X								X X	
5	RW-100	10/9/17	1200	10/9/17	1200	X	X								X X	
6	RW-12105STA-100917	10/9/17	1600	10/9/17	1600	X	X								X - 1,4-Dioxane (8260 SIM) only	
7	RW-919RND-101017	10/10/17	0900	10/10/17	0900	X	X								X X	
8	RW-919RND-101017-F	10/10/17	0910	10/10/17	0910	X	X								X X	
9	RW-0532R-101017	10/10/17	1105	10/10/17	1105	X	X								X X	
10	RW-2000	10/10/17	0935	10/10/17	0935	X	X								X X	
11	RW-1408PTC-101017	10/10/17	1232	10/10/17	1232	X	X								X X	
Turnaround Time (Business days)						Data Deliverable Information				Comments / Special Instructions						
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		Approved By (SGS Accutest PM): _____ _____				<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only, Commercial "B" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Raw data NJ Reduced = Results + QC Summary + Partial Raw data				INITIAL ASSESSMENT GEB LABEL VERIFICATION _____						
Emergency & Rush T/A data available VIA Lablink																
Sample Custody must be documented below each time samples change possession, including courier delivery.																
1	Relinquished by Sampler:	Date Time:	Received By:	1	FCY	Relinquished By:	2	Date Time:	10/10/17 9:50	Received By:	2	On Ice	Received By:	4	On Ice	Cooler Temp Z-22°F
3	Relinquished by Sampler:	Date Time:	Received By:	3		Relinquished By:	4	Date Time:		Received By:	4					
5	Relinquished by:	Date Time:	Received By:	5		Custody Seal #		Preserved Where Applicable								

Form:SM088-01C Rev. Date:9/13/16

JC52931: Chain of Custody
Page 1 of 3



ACCU TEST

CHAIN OF CUSTODY

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

PAGE 2 OF 2

JCS2931

Client / Reporting Information		Project Information				Requested Analysis (see TEST CODE sheet)				Matrix Codes					
Company Name WSP		Project Name: Kopflex Residential Well Sampling													
Street Address 13530 Dulles Technology Drive St 300		Street City State Zip				Billing Information (if different from Report to) Company Name									
City State Zip Henderson VA 20171															
Project Contact Eric Johnson eric.johnson@wsp.com		Project # 31400390X3				Street Address									
Phone # 703-709-6500		Client Purchase Order # _____				City State Zip									
Sampler(s) Name(s) Monica Keppler & Ben Foster		Phone # _____				Project Manager t				Attention:					
SGS Accident Sample #	Field ID / Point of Collection	Collection				Number of preserved bottles									
		MEOH/DI Visit #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	CH Water	MFOM	ENCORE
12	RW-1213 SPC-101017	10/10/17	1518	WSP	Ay	6	X								X X
13	RW-1213 SPC-101017-F	10/10/17	1530	WSP		6	X								X X
14	RW-1201 SSTA-101017	10/10/17	1645	WSP		6	X								X X
15	RW-1201 SSTA-101017-F	10/10/17	1705	WSP		6	X								X X
Turnaround Time (Business days)						Data Deliverable Information				Comments / Special Instructions					
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		Approved By (SGS Accutest PM): / Date: _____				<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____									
						NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only, Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data									
Emergency & Rush T/A data available VIA Lablink										Sample inventory is verified upon receipt in the Laboratory					
Sample Custody must be documented below each time samples change possession, including courier delivery.															
1	Relinquished by Sampler:	Date Time:	Received By:	1	Relinquished By:	2	Relinquished By:	FEDY	Date Time:	10/11/17 9:00	Received By:	2	Received By:	<i>[Signature]</i>	
3	Relinquished by Sampler:	Date Time:	Received By:	3	Relinquished By:	4	Relinquished By:		Date Time:		Received By:		Received By:		
5	Relinquished by:	Date Time:	Received By:	5	Custody Seal #		<input type="checkbox"/> Intact	Preserved where applicable			On Ice		Cooler Temp.		

Form SM088-01C Rev. Date: 9/13/16

JC52931: Chain of Custody

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SGS Accutest Sample Receipt Summary

Job Number: JC52931 Client: _____ Project: _____
 Date / Time Received: 10/11/2017 9:50:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.2);

Cooler Temps (Corrected) °C: Cooler 1: (0.6);

Cooler Security	Y or N	Y or N	Sample Integrity - Documentation	Y or N		
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
Cooler Temperature		Y or N	Sample Integrity - Condition			
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact		
4. No. Coolers:	1					
Quality Control Preservation		Y or N	N/A	Sample Integrity - Instructions	Y or N	N/A
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	
			5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>	

Comments

SM089-02
Rev. Date 12/1/16

JC52931: Chain of Custody

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MS Volatiles**QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries



Method Blank Summary

Page 1 of 2

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5347-MB	1B112106.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

Page 2 of 2

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5347-MB	1B112106.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits	
2199-69-1	1,2-Dichlorobenzene-d4	97%	70-130%
460-00-4	4-Bromofluorobenzene	87%	70-130%

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Method Blank Summary

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-MB	1B112158.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

Job Number: JC52931
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-MB	1B112158.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits	
2199-69-1	1,2-Dichlorobenzene-d4	93%	70-130%
460-00-4	4-Bromofluorobenzene	84%	70-130%

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-MB	1B112158.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method:

JC52931-15

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6794-MB	3A157838.D	1	10/12/17	PR	n/a	n/a	V3A6794

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC52931-1, JC52931-3, JC52931-4, JC52931-5, JC52931-6, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14, JC52931-15

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No. Surrogate Recoveries Limits

17647-74-4 1,4-Dioxane-d8 95% 51-175%

Blank Spike Summary

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-BS	1B112159.D	1	10/16/17	BK n/a	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	23.5	118	70-130
78-93-3	2-Butanone	20	20.5	103	70-130
71-43-2	Benzene	5	5.6	112	70-130
108-86-1	Bromobenzene	5	5.8	116	70-130
74-97-5	Bromochloromethane	5	6.2	124	70-130
75-27-4	Bromodichloromethane	5	5.9	118	70-130
75-25-2	Bromoform	5	6.2	124	70-130
74-83-9	Bromomethane	2	2.5	125	70-130
104-51-8	n-Butylbenzene	5	5.0	100	70-130
135-98-8	sec-Butylbenzene	5	5.1	102	70-130
98-06-6	tert-Butylbenzene	5	4.8	96	70-130
75-15-0	Carbon disulfide	5	6.6	132* a	70-130
108-90-7	Chlorobenzene	5	5.8	116	70-130
75-00-3	Chloroethane	2	2.4	120	70-130
67-66-3	Chloroform	5	6.0	120	70-130
74-87-3	Chloromethane	2	2.4	120	70-130
95-49-8	o-Chlorotoluene	5	5.4	108	70-130
106-43-4	p-Chlorotoluene	5	5.5	110	70-130
56-23-5	Carbon tetrachloride	5	6.0	120	70-130
75-34-3	1,1-Dichloroethane	5	6.2	124	70-130
75-35-4	1,1-Dichloroethylene	5	6.2	124	70-130
563-58-6	1,1-Dichloropropene	5	5.3	106	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	5.3	106	70-130
106-93-4	1,2-Dibromoethane	5	5.4	108	70-130
107-06-2	1,2-Dichloroethane	5	5.8	116	70-130
78-87-5	1,2-Dichloropropane	5	5.9	118	70-130
142-28-9	1,3-Dichloropropane	5	6.0	120	70-130
594-20-7	2,2-Dichloropropane	5	6.2	124	70-130
124-48-1	Dibromochloromethane	5	6.0	120	70-130
74-95-3	Dibromomethane	5	6.2	124	70-130
75-71-8	Dichlorodifluoromethane	2	2.1	105	70-130
541-73-1	m-Dichlorobenzene	5	5.9	118	70-130
95-50-1	o-Dichlorobenzene	5	5.6	112	70-130
106-46-7	p-Dichlorobenzene	5	5.6	112	70-130
156-60-5	trans-1,2-Dichloroethylene	5	6.0	120	70-130
156-59-2	cis-1,2-Dichloroethylene	5	5.3	106	70-130

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-BS	1B112159.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	5.2	104	70-130
10061-02-6	trans-1,3-Dichloropropene	5	5.6	112	70-130
100-41-4	Ethylbenzene	5	5.4	108	70-130
87-68-3	Hexachlorobutadiene	5	5.4	108	70-130
591-78-6	2-Hexanone	20	19.8	99	70-130
98-82-8	Isopropylbenzene	5	4.9	98	70-130
99-87-6	p-Isopropyltoluene	5	5.0	100	70-130
75-09-2	Methylene chloride	5	6.7	134* a	70-130
1634-04-4	Methyl Tert Butyl Ether	5	5.8	116	70-130
108-10-1	4-Methyl-2-pentanone	20	21.2	106	70-130
91-20-3	Naphthalene	5	4.6	92	70-130
103-65-1	n-Propylbenzene	5	5.3	106	70-130
100-42-5	Styrene	5	5.3	106	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	6.0	120	70-130
71-55-6	1,1,1-Trichloroethane	5	5.8	116	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	5.8	116	70-130
79-00-5	1,1,2-Trichloroethane	5	5.9	118	70-130
87-61-6	1,2,3-Trichlorobenzene	5	5.2	104	70-130
96-18-4	1,2,3-Trichloropropane	5	5.9	118	70-130
120-82-1	1,2,4-Trichlorobenzene	5	5.0	100	70-130
95-63-6	1,2,4-Trimethylbenzene	5	5.4	108	70-130
108-67-8	1,3,5-Trimethylbenzene	5	5.4	108	70-130
127-18-4	Tetrachloroethylene	5	5.8	116	70-130
108-88-3	Toluene	5	5.3	106	70-130
79-01-6	Trichloroethylene	5	5.6	112	70-130
75-69-4	Trichlorofluoromethane	2	2.3	115	70-130
75-01-4	Vinyl chloride	2	2.2	110	70-130
	m,p-Xylene	10	10.9	109	70-130
95-47-6	o-Xylene	5	5.3	106	70-130
1330-20-7	Xylenes (total)	15	16.2	108	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	104%	70-130%
460-00-4	4-Bromofluorobenzene	93%	70-130%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JC52931
Account: ESCVAR WSP Environment & Energy
Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5351-BS	1B112159.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6794-BS	3A157839.D	1	10/12/17	PR	n/a	n/a	V3A6794

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC52931-1, JC52931-3, JC52931-4, JC52931-5, JC52931-6, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14, JC52931-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
123-91-1	1,4-Dioxane	20	19.2	96	58-138

CAS No.	Surrogate Recoveries	BSP	Limits
17647-74-4	1,4-Dioxane-d8	99%	51-175%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5347-BS	1B112107.D	1	10/12/17	BK	n/a	n/a	V1B5347
V1B5347-BSD	1B112108.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	20	16.9	85	17.2	86	2	70-130/30
78-93-3	2-Butanone	20	15.5	78	14.8	74	5	70-130/30
71-43-2	Benzene	5	4.3	86	4.1	82	5	70-130/30
108-86-1	Bromobenzene	5	4.4	88	4.3	86	2	70-130/30
74-97-5	Bromochloromethane	5	4.7	94	4.4	88	7	70-130/30
75-27-4	Bromodichloromethane	5	4.3	86	4.1	82	5	70-130/30
75-25-2	Bromoform	5	4.5	90	4.3	86	5	70-130/30
74-83-9	Bromomethane	2	1.7	85	1.7	85	0	70-130/30
104-51-8	n-Butylbenzene	5	4.1	82	3.9	78	5	70-130/30
135-98-8	sec-Butylbenzene	5	4.2	84	3.9	78	7	70-130/30
98-06-6	tert-Butylbenzene	5	3.9	78	3.8	76	3	70-130/30
75-15-0	Carbon disulfide	5	4.7	94	4.4	88	7	70-130/30
108-90-7	Chlorobenzene	5	4.5	90	4.2	84	7	70-130/30
75-00-3	Chloroethane	2	1.7	85	1.6	80	6	70-130/30
67-66-3	Chloroform	5	4.5	90	4.3	86	5	70-130/30
74-87-3	Chloromethane	2	1.7	85	1.6	80	6	70-130/30
95-49-8	o-Chlorotoluene	5	4.3	86	4.1	82	5	70-130/30
106-43-4	p-Chlorotoluene	5	4.3	86	4.1	82	5	70-130/30
56-23-5	Carbon tetrachloride	5	4.5	90	4.2	84	7	70-130/30
75-34-3	1,1-Dichloroethane	5	4.5	90	4.2	84	7	70-130/30
75-35-4	1,1-Dichloroethylene	5	4.5	90	4.2	84	7	70-130/30
563-58-6	1,1-Dichloropropene	5	4.1	82	3.9	78	5	70-130/30
96-12-8	1,2-Dibromo-3-chloropropane	5	4.1	82	4.0	80	2	70-130/30
106-93-4	1,2-Dibromoethane	5	4.1	82	4.0	80	2	70-130/30
107-06-2	1,2-Dichloroethane	5	4.4	88	4.2	84	5	70-130/30
78-87-5	1,2-Dichloropropane	5	4.4	88	4.2	84	5	70-130/30
142-28-9	1,3-Dichloropropane	5	4.5	90	4.3	86	5	70-130/30
594-20-7	2,2-Dichloropropane	5	4.6	92	4.3	86	7	70-130/30
124-48-1	Dibromochloromethane	5	4.5	90	4.3	86	5	70-130/30
74-95-3	Dibromomethane	5	4.5	90	4.3	86	5	70-130/30
75-71-8	Dichlorodifluoromethane	2	1.6	80	1.5	75	6	70-130/30
541-73-1	m-Dichlorobenzene	5	4.5	90	4.3	86	5	70-130/30
95-50-1	o-Dichlorobenzene	5	4.4	88	4.2	84	5	70-130/30
106-46-7	p-Dichlorobenzene	5	4.4	88	4.2	84	5	70-130/30
156-60-5	trans-1,2-Dichloroethylene	5	4.2	84	4.3	86	2	70-130/30
156-59-2	cis-1,2-Dichloroethylene	5	4.1	82	4.0	80	2	70-130/30

* = Outside of Control Limits.

6.3.1

Blank Spike/Blank Spike Duplicate Summary

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5347-BS	1B112107.D	1	10/12/17	BK	n/a	n/a	V1B5347
V1B5347-BSD	1B112108.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	5	4.1	82	3.9	78	5	70-130/30
10061-02-6	trans-1,3-Dichloropropene	5	4.3	86	4.1	82	5	70-130/30
100-41-4	Ethylbenzene	5	4.2	84	4.0	80	5	70-130/30
87-68-3	Hexachlorobutadiene	5	4.4	88	4.1	82	7	70-130/30
591-78-6	2-Hexanone	20	15.6	78	15.1	76	3	70-130/30
98-82-8	Isopropylbenzene	5	3.9	78	3.8	76	3	70-130/30
99-87-6	p-Isopropyltoluene	5	4.1	82	3.9	78	5	70-130/30
75-09-2	Methylene chloride	5	5.0	100	4.8	96	4	70-130/30
1634-04-4	Methyl Tert Butyl Ether	5	4.0	80	4.3	86	7	70-130/30
108-10-1	4-Methyl-2-pentanone	20	16.3	82	15.7	79	4	70-130/30
91-20-3	Naphthalene	5	3.8	76	3.7	74	3	70-130/30
103-65-1	n-Propylbenzene	5	4.2	84	4.0	80	5	70-130/30
100-42-5	Styrene	5	4.2	84	4.0	80	5	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	5	4.5	90	4.3	86	5	70-130/30
71-55-6	1,1,1-Trichloroethane	5	4.3	86	4.1	82	5	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	5	4.4	88	4.2	84	5	70-130/30
79-00-5	1,1,2-Trichloroethane	5	4.4	88	4.2	84	5	70-130/30
87-61-6	1,2,3-Trichlorobenzene	5	4.2	84	4.0	80	5	70-130/30
96-18-4	1,2,3-Trichloropropane	5	4.4	88	4.3	86	2	70-130/30
120-82-1	1,2,4-Trichlorobenzene	5	4.1	82	4.0	80	2	70-130/30
95-63-6	1,2,4-Trimethylbenzene	5	4.3	86	4.1	82	5	70-130/30
108-67-8	1,3,5-Trimethylbenzene	5	4.3	86	4.0	80	7	70-130/30
127-18-4	Tetrachloroethylene	5	4.5	90	4.2	84	7	70-130/30
108-88-3	Toluene	5	4.1	82	4.0	80	2	70-130/30
79-01-6	Trichloroethylene	5	4.3	86	4.0	80	7	70-130/30
75-69-4	Trichlorofluoromethane	2	1.7	85	1.6	80	6	70-130/30
75-01-4	Vinyl chloride	2	1.6	80	1.6	80	0	70-130/30
	m,p-Xylene	10	8.5	85	8.2	82	4	70-130/30
95-47-6	o-Xylene	5	4.2	84	4.0	80	5	70-130/30
1330-20-7	Xylenes (total)	15	12.8	85	12.2	81	5	70-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
2199-69-1	1,2-Dichlorobenzene-d4	102%	102%	70-130%
460-00-4	4-Bromofluorobenzene	94%	94%	70-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-2MS	1B112114.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-2 ^a	1B112111.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	JC52931-2		Spike	MS	MS	Limits
		ug/l	Q	ug/l	ug/l	%	
67-64-1	Acetone	ND	20	21.4	107	41-142	
78-93-3	2-Butanone	ND	20	19.2	96	55-129	
71-43-2	Benzene	ND	5	5.0	100	53-138	
108-86-1	Bromobenzene	ND	5	5.3	106	54-138	
74-97-5	Bromochloromethane	ND	5	5.2	104	55-140	
75-27-4	Bromodichloromethane	ND	5	5.2	104	57-147	
75-25-2	Bromoform	ND	5	5.4	108	47-137	
74-83-9	Bromomethane	ND	2	2.3	115	40-162	
104-51-8	n-Butylbenzene	ND	5	4.4	88	45-144	
135-98-8	sec-Butylbenzene	ND	5	4.6	92	46-145	
98-06-6	tert-Butylbenzene	ND	5	4.3	86	48-141	
75-15-0	Carbon disulfide	ND	5	5.8	116	35-127	
108-90-7	Chlorobenzene	ND	5	5.4	108	54-135	
75-00-3	Chloroethane	ND	2	2.3	115	38-153	
67-66-3	Chloroform	ND	5	5.2	104	57-151	
74-87-3	Chloromethane	ND	2	2.3	115	39-165	
95-49-8	o-Chlorotoluene	ND	5	5.0	100	55-142	
106-43-4	p-Chlorotoluene	ND	5	5.0	100	55-139	
56-23-5	Carbon tetrachloride	ND	5	5.3	106	49-170	
75-34-3	1,1-Dichloroethane	ND	5	5.3	106	55-149	
75-35-4	1,1-Dichloroethylene	ND	5	5.6	112	42-142	
563-58-6	1,1-Dichloropropene	ND	5	4.9	98	46-151	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	5.2	104	48-141	
106-93-4	1,2-Dibromoethane	ND	5	5.2	104	57-135	
107-06-2	1,2-Dichloroethane	ND	5	5.0	100	59-166	
78-87-5	1,2-Dichloropropane	ND	5	5.2	104	53-142	
142-28-9	1,3-Dichloropropane	ND	5	5.5	110	58-143	
594-20-7	2,2-Dichloropropane	ND	5	5.4	108	38-165	
124-48-1	Dibromochloromethane	ND	5	5.5	110	55-138	
74-95-3	Dibromomethane	ND	5	5.5	110	61-144	
75-71-8	Dichlorodifluoromethane	ND	2	2.2	110	23-172	
541-73-1	m-Dichlorobenzene	ND	5	5.3	106	53-138	
95-50-1	o-Dichlorobenzene	ND	5	5.2	104	54-140	
106-46-7	p-Dichlorobenzene	ND	5	5.2	104	53-137	
156-60-5	trans-1,2-Dichloroethylene	ND	5	5.6	112	47-148	
156-59-2	cis-1,2-Dichloroethylene	ND	5	4.7	94	51-146	

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-2MS	1B112114.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-2 ^a	1B112111.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	JC52931-2 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	4.8	96	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	5.2	104	54-142
100-41-4	Ethylbenzene	ND	5	4.9	98	51-138
87-68-3	Hexachlorobutadiene	ND	5	4.9	98	40-154
591-78-6	2-Hexanone	ND	20	20.2	101	53-128
98-82-8	Isopropylbenzene	ND	5	4.5	90	49-139
99-87-6	p-Isopropyltoluene	ND	5	4.5	90	45-141
75-09-2	Methylene chloride	ND	5	5.7	114	54-137
1634-04-4	Methyl Tert Butyl Ether	ND	5	5.0	100	53-143
108-10-1	4-Methyl-2-pentanone	ND	20	21.0	105	58-127
91-20-3	Naphthalene	ND	5	4.3	86	44-140
103-65-1	n-Propylbenzene	ND	5	4.8	96	50-142
100-42-5	Styrene	ND	5	4.8	96	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	5.5	110	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	5.1	102	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	5.7	114	58-138
79-00-5	1,1,2-Trichloroethane	ND	5	5.5	110	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	4.6	92	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	5.8	116	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	4.5	90	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	4.7	94	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	4.8	96	45-138
127-18-4	Tetrachloroethylene	ND	5	5.3	106	45-145
108-88-3	Toluene	ND	5	4.8	96	52-134
79-01-6	Trichloroethylene	ND	5	5.1	102	54-143
75-69-4	Trichlorofluoromethane	ND	2	2.3	115	36-167
75-01-4	Vinyl chloride	ND	2	2.3	115	35-162
	m,p-Xylene	ND	10	10.0	100	49-135
95-47-6	o-Xylene	ND	5	4.9	98	49-134
1330-20-7	Xylenes (total)	ND	15	14.9	99	50-134

CAS No.	Surrogate Recoveries	MS	JC52931-2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	102%	92%	70-130%
460-00-4	4-Bromofluorobenzene	93%	83%	70-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-2MS	1B112114.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-2 ^a	1B112111.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

(a) EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53135-1MS	1B112168.D	1	10/16/17	BK	n/a	n/a	V1B5351
JC53135-1	1B112164.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	JC53135-1 ug/l	Spike Q	MS ug/l	MS %	Limits
67-64-1	Acetone	ND	20	20.4	102	41-142
78-93-3	2-Butanone	ND	20	17.5	88	55-129
71-43-2	Benzene	ND	5	5.6	112	53-138
108-86-1	Bromobenzene	ND	5	5.3	106	54-138
74-97-5	Bromochloromethane	ND	5	5.5	110	55-140
75-27-4	Bromodichloromethane	ND	5	5.6	112	57-147
75-25-2	Bromoform	ND	5	5.5	110	47-137
74-83-9	Bromomethane	ND	2	2.2	110	40-162
104-51-8	n-Butylbenzene	ND	5	4.9	98	45-144
135-98-8	sec-Butylbenzene	ND	5	5.0	100	46-145
98-06-6	tert-Butylbenzene	ND	5	4.6	92	48-141
75-15-0	Carbon disulfide	ND	5	6.7	134* a	35-127
108-90-7	Chlorobenzene	ND	5	5.4	108	54-135
75-00-3	Chloroethane	ND	2	2.3	115	38-153
67-66-3	Chloroform	ND	5	5.7	114	57-151
74-87-3	Chloromethane	ND	2	2.2	110	39-165
95-49-8	o-Chlorotoluene	ND	5	5.2	104	55-142
106-43-4	p-Chlorotoluene	ND	5	5.2	104	55-139
56-23-5	Carbon tetrachloride	ND	5	5.9	118	49-170
75-34-3	1,1-Dichloroethane	ND	5	5.8	116	55-149
75-35-4	1,1-Dichloroethylene	ND	5	6.1	122	42-142
563-58-6	1,1-Dichloropropene	ND	5	5.4	108	46-151
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	4.8	96	48-141
106-93-4	1,2-Dibromoethane	ND	5	5.0	100	57-135
107-06-2	1,2-Dichloroethane	ND	5	5.6	112	59-166
78-87-5	1,2-Dichloropropane	ND	5	5.8	116	53-142
142-28-9	1,3-Dichloropropane	ND	5	5.5	110	58-143
594-20-7	2,2-Dichloropropane	ND	5	6.1	122	38-165
124-48-1	Dibromochloromethane	ND	5	5.7	114	55-138
74-95-3	Dibromomethane	ND	5	5.7	114	61-144
75-71-8	Dichlorodifluoromethane	ND	2	1.8	90	23-172
541-73-1	m-Dichlorobenzene	ND	5	5.5	110	53-138
95-50-1	o-Dichlorobenzene	ND	5	5.3	106	54-140
106-46-7	p-Dichlorobenzene	ND	5	5.3	106	53-137
156-60-5	trans-1,2-Dichloroethylene	ND	5	5.3	106	47-148
156-59-2	cis-1,2-Dichloroethylene	ND	5	5.1	102	51-146

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53135-1MS	1B112168.D	1	10/16/17	BK	n/a	n/a	V1B5351
JC53135-1	1B112164.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	JC53135-1 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	4.8	96	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	5.1	102	54-142
100-41-4	Ethylbenzene	ND	5	5.1	102	51-138
87-68-3	Hexachlorobutadiene	ND	5	5.3	106	40-154
591-78-6	2-Hexanone	ND	20	16.7	84	53-128
98-82-8	Isopropylbenzene	ND	5	4.7	94	49-139
99-87-6	p-Isopropyltoluene	ND	5	4.9	98	45-141
75-09-2	Methylene chloride	ND	5	6.5	130	54-137
1634-04-4	Methyl Tert Butyl Ether	ND	10	9.7	97	53-143
108-10-1	4-Methyl-2-pentanone	ND	20	18.3	92	58-127
91-20-3	Naphthalene	ND	5	4.0	80	44-140
103-65-1	n-Propylbenzene	ND	5	5.2	104	50-142
100-42-5	Styrene	ND	5	5.1	102	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	5.7	114	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	5.6	112	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	5.3	106	58-138
79-00-5	1,1,2-Trichloroethane	ND	5	5.5	110	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	4.6	92	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	5.3	106	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	4.6	92	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	5.1	102	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	5.2	104	45-138
127-18-4	Tetrachloroethylene	ND	5	5.9	118	45-145
108-88-3	Toluene	ND	5	5.1	102	52-134
79-01-6	Trichloroethylene	ND	5	5.6	112	54-143
75-69-4	Trichlorofluoromethane	ND	2	2.2	110	36-167
75-01-4	Vinyl chloride	ND	2	2.0	100	35-162
	m,p-Xylene	ND	10	10.5	105	49-135
95-47-6	o-Xylene	ND	5	5.0	100	49-134
1330-20-7	Xylenes (total)	ND	15	15.5	103	50-134

CAS No.	Surrogate Recoveries	MS	JC53135-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	103%	91%	70-130%
460-00-4	4-Bromofluorobenzene	94%	76%	70-130%

* = Outside of Control Limits.

Matrix Spike Summary

Page 3 of 3

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53135-1MS	1B112168.D	1	10/16/17	BK	n/a	n/a	V1B5351
JC53135-1	1B112164.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

(a) Outside control limits.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-11MS	3A157857.D	1	10/12/17	PR	n/a	n/a	V3A6794
JC52931-11	3A157842.D	1	10/12/17	PR	n/a	n/a	V3A6794

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC52931-1, JC52931-3, JC52931-4, JC52931-5, JC52931-6, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14, JC52931-15

CAS No.	Compound	JC52931-11		Spike	MS	MS	Limits
		ug/l	Q	ug/l	ug/l	%	
123-91-1	1,4-Dioxane	ND		20	23.8	119	36-166

CAS No.	Surrogate Recoveries	MS	JC52931-11	Limits
17647-74-4	1,4-Dioxane-d8	118%	100%	51-175%

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-3DUP	1B112115.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-3 ^a	1B112112.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	JC52931-3		Q	RPD	Limits
		ug/l	ug/l			
67-64-1	Acetone	ND	ND	nc	10	
78-93-3	2-Butanone	ND	ND	nc	12	
71-43-2	Benzene	ND	ND	nc	10	
108-86-1	Bromobenzene	ND	ND	nc	10	
74-97-5	Bromochloromethane	ND	ND	nc	10	
75-27-4	Bromodichloromethane	ND	ND	nc	10	
75-25-2	Bromoform	ND	ND	nc	10	
74-83-9	Bromomethane	ND	ND	nc	10	
104-51-8	n-Butylbenzene	ND	ND	nc	10	
135-98-8	sec-Butylbenzene	ND	ND	nc	10	
98-06-6	tert-Butylbenzene	ND	ND	nc	10	
75-15-0	Carbon disulfide	ND	ND	nc	19	
108-90-7	Chlorobenzene	ND	ND	nc	10	
75-00-3	Chloroethane	ND	ND	nc	10	
67-66-3	Chloroform	ND	ND	nc	12	
74-87-3	Chloromethane	ND	ND	nc	10	
95-49-8	o-Chlorotoluene	ND	ND	nc	10	
106-43-4	p-Chlorotoluene	ND	ND	nc	10	
56-23-5	Carbon tetrachloride	ND	ND	nc	10	
75-34-3	1,1-Dichloroethane	ND	ND	nc	10	
75-35-4	1,1-Dichloroethylene	ND	ND	nc	10	
563-58-6	1,1-Dichloropropene	ND	ND	nc	10	
96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	nc	10	
106-93-4	1,2-Dibromoethane	ND	ND	nc	10	
107-06-2	1,2-Dichloroethane	ND	ND	nc	10	
78-87-5	1,2-Dichloropropane	ND	ND	nc	10	
142-28-9	1,3-Dichloropropane	ND	ND	nc	10	
594-20-7	2,2-Dichloropropane	ND	ND	nc	10	
124-48-1	Dibromochloromethane	ND	ND	nc	10	
74-95-3	Dibromomethane	ND	ND	nc	10	
75-71-8	Dichlorodifluoromethane	ND	ND	nc	10	
541-73-1	m-Dichlorobenzene	ND	ND	nc	10	
95-50-1	o-Dichlorobenzene	ND	ND	nc	10	
106-46-7	p-Dichlorobenzene	ND	ND	nc	10	
156-60-5	trans-1,2-Dichloroethylene	ND	ND	nc	10	
156-59-2	cis-1,2-Dichloroethylene	ND	ND	nc	10	

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-3DUP	1B112115.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-3 ^a	1B112112.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

CAS No.	Compound	JC52931-3		Q	RPD	Limits
		ug/l	ug/l			
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10	
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10	
100-41-4	Ethylbenzene	ND	ND	nc	10	
87-68-3	Hexachlorobutadiene	ND	ND	nc	10	
591-78-6	2-Hexanone	ND	ND	nc	10	
98-82-8	Isopropylbenzene	ND	ND	nc	10	
99-87-6	p-Isopropyltoluene	ND	ND	nc	10	
75-09-2	Methylene chloride	ND	ND	nc	10	
1634-04-4	Methyl Tert Butyl Ether	4.5	5.9	27* b	10	
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10	
91-20-3	Naphthalene	ND	ND	nc	10	
103-65-1	n-Propylbenzene	ND	ND	nc	10	
100-42-5	Styrene	ND	ND	nc	10	
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10	
71-55-6	1,1,1-Trichloroethane	ND	ND	nc	10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10	
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10	
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10	
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10	
127-18-4	Tetrachloroethylene	ND	ND	nc	10	
108-88-3	Toluene	ND	ND	nc	10	
79-01-6	Trichloroethylene	ND	ND	nc	10	
75-69-4	Trichlorofluoromethane	ND	ND	nc	10	
75-01-4	Vinyl chloride	ND	ND	nc	10	
	m,p-Xylene	ND	ND	nc	10	
95-47-6	o-Xylene	ND	ND	nc	10	
1330-20-7	Xylenes (total)	ND	ND	nc	10	

CAS No.	Surrogate Recoveries	DUP	JC52931-3	Limits
2199-69-1	1,2-Dichlorobenzene-d4	94%	94%	70-130%
460-00-4	4-Bromofluorobenzene	84%	84%	70-130%

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-3DUP	1B112115.D	1	10/12/17	BK	n/a	n/a	V1B5347
JC52931-3 ^a	1B112112.D	1	10/12/17	BK	n/a	n/a	V1B5347

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-1, JC52931-2, JC52931-3, JC52931-4, JC52931-5, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14

(a) EPA 524.2 is not a certified method for non-potable water samples. Sample received outside holding time.

(b) Outside in house control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52982-1DUP	1B112166.D	1	10/16/17	BK	n/a	n/a	V1B5351
JC52982-1	1B112161.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	JC52982-1		Q	RPD	Limits
		ug/l	DUP ug/l			
67-64-1	Acetone	ND	ND	nc	10	
78-93-3	2-Butanone	ND	ND	nc	12	
71-43-2	Benzene	ND	ND	nc	10	
108-86-1	Bromobenzene	ND	ND	nc	10	
74-97-5	Bromochloromethane	ND	ND	nc	10	
75-27-4	Bromodichloromethane	ND	ND	nc	10	
75-25-2	Bromoform	ND	ND	nc	10	
74-83-9	Bromomethane	ND	ND	nc	10	
104-51-8	n-Butylbenzene	ND	ND	nc	10	
135-98-8	sec-Butylbenzene	ND	ND	nc	10	
98-06-6	tert-Butylbenzene	ND	ND	nc	10	
75-15-0	Carbon disulfide	ND	ND	nc	19	
108-90-7	Chlorobenzene	ND	ND	nc	10	
75-00-3	Chloroethane	ND	ND	nc	10	
67-66-3	Chloroform	ND	ND	nc	12	
74-87-3	Chloromethane	ND	ND	nc	10	
95-49-8	o-Chlorotoluene	ND	ND	nc	10	
106-43-4	p-Chlorotoluene	ND	ND	nc	10	
56-23-5	Carbon tetrachloride	ND	ND	nc	10	
75-34-3	1,1-Dichloroethane	ND	ND	nc	10	
75-35-4	1,1-Dichloroethylene	ND	ND	nc	10	
563-58-6	1,1-Dichloropropene	ND	ND	nc	10	
96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	nc	10	
106-93-4	1,2-Dibromoethane	ND	ND	nc	10	
107-06-2	1,2-Dichloroethane	ND	ND	nc	10	
78-87-5	1,2-Dichloropropane	ND	ND	nc	10	
142-28-9	1,3-Dichloropropane	ND	ND	nc	10	
594-20-7	2,2-Dichloropropane	ND	ND	nc	10	
124-48-1	Dibromochloromethane	ND	ND	nc	10	
74-95-3	Dibromomethane	ND	ND	nc	10	
75-71-8	Dichlorodifluoromethane	ND	ND	nc	10	
541-73-1	m-Dichlorobenzene	ND	ND	nc	10	
95-50-1	o-Dichlorobenzene	ND	ND	nc	10	
106-46-7	p-Dichlorobenzene	ND	ND	nc	10	
156-60-5	trans-1,2-Dichloroethylene	ND	ND	nc	10	
156-59-2	cis-1,2-Dichloroethylene	ND	ND	nc	10	

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52982-1DUP	1B112166.D	1	10/16/17	BK	n/a	n/a	V1B5351
JC52982-1	1B112161.D	1	10/16/17	BK	n/a	n/a	V1B5351

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC52931-15

CAS No.	Compound	JC52982-1		Q	RPD	Limits
		ug/l	ug/l			
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10	
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10	
100-41-4	Ethylbenzene	ND	ND	nc	10	
87-68-3	Hexachlorobutadiene	ND	ND	nc	10	
591-78-6	2-Hexanone	ND	ND	nc	10	
98-82-8	Isopropylbenzene	ND	ND	nc	10	
99-87-6	p-Isopropyltoluene	ND	ND	nc	10	
75-09-2	Methylene chloride	ND	ND	nc	10	
1634-04-4	Methyl Tert Butyl Ether	ND	ND	nc	10	
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10	
91-20-3	Naphthalene	ND	ND	nc	10	
103-65-1	n-Propylbenzene	ND	ND	nc	10	
100-42-5	Styrene	ND	ND	nc	10	
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10	
71-55-6	1,1,1-Trichloroethane	ND	ND	nc	10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10	
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10	
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10	
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10	
127-18-4	Tetrachloroethylene	ND	ND	nc	10	
108-88-3	Toluene	ND	ND	nc	10	
79-01-6	Trichloroethylene	ND	ND	nc	10	
75-69-4	Trichlorofluoromethane	ND	ND	nc	10	
75-01-4	Vinyl chloride	ND	ND	nc	10	
	m,p-Xylene	ND	ND	nc	10	
95-47-6	o-Xylene	ND	ND	nc	10	
1330-20-7	Xylenes (total)	ND	ND	nc	10	

CAS No.	Surrogate Recoveries	DUP	JC52982-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	95%	92%	70-130%
460-00-4	4-Bromofluorobenzene	81%	81%	70-130%

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC52931-6DUP	3A157856.D	1	10/12/17	PR	n/a	n/a	V3A6794
JC52931-6	3A157841.D	1	10/12/17	PR	n/a	n/a	V3A6794

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC52931-1, JC52931-3, JC52931-4, JC52931-5, JC52931-6, JC52931-7, JC52931-8, JC52931-9, JC52931-10, JC52931-11, JC52931-12, JC52931-13, JC52931-14, JC52931-15

CAS No.	Compound	JC52931-6		DUP	Q	RPD	Limits
		ug/l	ug/l	ND			
123-91-1	1,4-Dioxane			ND	ND	nc	37

CAS No.	Surrogate Recoveries	DUP	JC52931-6	Limits
17647-74-4	1,4-Dioxane-d8	117%	110%	51-175%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5344-BFB	Injection Date:	10/10/17
Lab File ID:	1B112059.D	Injection Time:	11:22
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3464	18.7	Pass
75	30.0 - 80.0% of mass 95	9366	50.7	Pass
95	Base peak, 100% relative abundance	18475	100.0	Pass
96	5.0 - 9.0% of mass 95	1152	6.24	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	16619	90.0	Pass
175	5.0 - 9.0% of mass 174	1199	6.49	(7.21) ^a Pass
176	95.0 - 101.0% of mass 174	16106	87.2	(96.9) ^a Pass
177	5.0 - 9.0% of mass 176	1041	5.63	(6.46) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5344-IC5344	1B112060.D	10/10/17	11:55	00:33	Initial cal 0.2
V1B5344-IC5344	1B112063.D	10/10/17	13:32	02:10	Initial cal 2
V1B5344-IC5344	1B112064.D	10/10/17	14:03	02:41	Initial cal 5
V1B5344-ICC5344	1B112065.D	10/10/17	14:34	03:12	Initial cal 10
V1B5344-IC5344	1B112066.D	10/10/17	15:06	03:44	Initial cal 20
V1B5344-IC5344	1B112067.D	10/10/17	15:38	04:16	Initial cal 40
V1B5344-IC5344	1B112068.D	10/10/17	16:10	04:48	Initial cal 80
V1B5344-IC5344	1B112071.D	10/10/17	17:45	06:23	Initial cal 0.5
V1B5344-IC5344	1B112072.D	10/10/17	18:17	06:55	Initial cal 1
V1B5344-ICV5344	1B112073.D	10/10/17	20:30	09:08	Initial cal verification 10
V1B5345-MB	1B112074.D	10/10/17	21:02	09:40	Method Blank
V1B5345-BS	1B112075.D	10/10/17	21:34	10:12	Blank Spike
ZZZZZZ	1B112076.D	10/10/17	22:06	10:44	(unrelated sample)

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5347-BFB	Injection Date:	10/12/17
Lab File ID:	1B112104.D	Injection Time:	08:12
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	2723	20.2	Pass
75	30.0 - 80.0% of mass 95	6754	50.1	Pass
95	Base peak, 100% relative abundance	13480	100.0	Pass
96	5.0 - 9.0% of mass 95	1042	7.73	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	12613	93.6	Pass
175	5.0 - 9.0% of mass 174	896	6.65	(7.10) ^a Pass
176	95.0 - 101.0% of mass 174	12199	90.5	(96.7) ^a Pass
177	5.0 - 9.0% of mass 176	837	6.21	(6.86) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5347-CC5344	1B112105.D	10/12/17	09:02	00:50	Continuing cal 5
V1B5347-MB	1B112106.D	10/12/17	09:43	01:31	Method Blank
V1B5347-BS	1B112107.D	10/12/17	10:15	02:03	Blank Spike
V1B5347-BSD	1B112108.D	10/12/17	10:47	02:35	Blank Spike Duplicate
ZZZZZZ	1B112109.D	10/12/17	11:34	03:22	(unrelated sample)
JC52931-1	1B112110.D	10/12/17	12:07	03:55	TB-101017
JC52931-2	1B112111.D	10/12/17	12:38	04:26	RW-1210SSTA
JC52931-3	1B112112.D	10/12/17	13:10	04:58	RW-7921BHC-100917-F
JC52931-4	1B112113.D	10/12/17	13:42	05:30	RW-7921BHC-100917
JC52931-2MS	1B112114.D	10/12/17	14:14	06:02	Matrix Spike
JC52931-3DUP	1B112115.D	10/12/17	14:46	06:34	Duplicate
ZZZZZZ	1B112116.D	10/12/17	15:20	07:08	(unrelated sample)
JC52931-5	1B112117.D	10/12/17	15:52	07:40	RW-100
JC52931-7	1B112118.D	10/12/17	16:23	08:11	RW-919RMD-101017
JC52931-8	1B112119.D	10/12/17	16:55	08:43	RW-919RMD-101017-F
JC52931-9	1B112120.D	10/12/17	17:27	09:15	RW-853RR--101017
JC52931-10	1B112121.D	10/12/17	17:59	09:47	RW-200
JC52931-11	1B112122.D	10/12/17	18:30	10:18	RW-1408PTC-101017
JC52931-12	1B112123.D	10/12/17	19:03	10:51	RW-1217SPC-101017
JC52931-13	1B112124.D	10/12/17	19:35	11:23	RW-1217SPC-101017-F
JC52931-14	1B112125.D	10/12/17	20:07	11:55	RW-1201SSTA-101017

Instrument Performance Check (BFB)

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Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5351-BFB	Injection Date:	10/16/17
Lab File ID:	1B112156.D	Injection Time:	12:57
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	2113	19.9	Pass
75	30.0 - 80.0% of mass 95	5212	49.2	Pass
95	Base peak, 100% relative abundance	10598	100.0	Pass
96	5.0 - 9.0% of mass 95	804	7.59	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	9849	92.9	Pass
175	5.0 - 9.0% of mass 174	759	7.16	(7.71) ^a Pass
176	95.0 - 101.0% of mass 174	9625	90.8	(97.7) ^a Pass
177	5.0 - 9.0% of mass 176	637	6.01	(6.62) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5351-CC5344	1B112157.D	10/16/17	13:39	00:42	Continuing cal 10
V1B5351-MB	1B112158.D	10/16/17	14:15	01:18	Method Blank
V1B5351-BS	1B112159.D	10/16/17	14:55	01:58	Blank Spike
JC52931-15	1B112160.D	10/16/17	15:38	02:41	RW-1201SSTA-101017-F
JC52982-1	1B112161.D	10/16/17	16:09	03:12	(used for QC only; not part of job JC52931)
ZZZZZZ	1B112163.D	10/16/17	17:13	04:16	(unrelated sample)
JC53135-1	1B112164.D	10/16/17	17:44	04:47	(used for QC only; not part of job JC52931)
ZZZZZZ	1B112165.D	10/16/17	18:16	05:19	(unrelated sample)
JC52982-1DUP	1B112166.D	10/16/17	19:00	06:03	Duplicate
JC53135-1MS	1B112168.D	10/16/17	20:38	07:41	Matrix Spike

Instrument Performance Check (BFB)

Job Number: JC52931

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6787-BFB	Injection Date:	09/27/17
Lab File ID:	3A157637.D	Injection Time:	09:47
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	8122	18.0	Pass
75	30.0 - 60.0% of mass 95	22219	49.3	Pass
95	Base peak, 100% relative abundance	45101	100.0	Pass
96	5.0 - 9.0% of mass 95	2935	6.51	Pass
173	Less than 2.0% of mass 174	240	0.53	(0.74) ^a Pass
174	50.0 - 120.0% of mass 95	32469	72.0	Pass
175	5.0 - 9.0% of mass 174	2483	5.51	(7.65) ^a Pass
176	95.0 - 101.0% of mass 174	30872	68.5	(95.1) ^a Pass
177	5.0 - 9.0% of mass 176	2102	4.66	(6.81) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6787-IC6787	3A157638.D	09/27/17	10:21	00:34	Initial cal 0.25
V3A6787-IC6787	3A157639.D	09/27/17	10:47	01:00	Initial cal 0.4
V3A6787-IC6787	3A157640.D	09/27/17	11:13	01:26	Initial cal 1
V3A6787-IC6787	3A157641.D	09/27/17	11:39	01:52	Initial cal 2
V3A6787-IC6787	3A157642.D	09/27/17	12:06	02:19	Initial cal 5
V3A6787-ICC6787	3A157643.D	09/27/17	12:32	02:45	Initial cal 20
V3A6787-IC6787	3A157644.D	09/27/17	12:58	03:11	Initial cal 50
V3A6787-IC6787	3A157645.D	09/27/17	13:24	03:37	Initial cal 100
V3A6787-IC6787	3A157646.D	09/27/17	13:49	04:02	Initial cal 200
V3A6787-ICV6787	3A157649.D	09/27/17	15:08	05:21	Initial cal verification 20
V3A6785-MB2	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6788-MB	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6785-BS2	3A157652.D	09/27/17	16:26	06:39	Blank Spike
V3A6788-BS	3A157652.D	09/27/17	16:26	06:39	Blank Spike
JC51376-1DUP	3A157654.D	09/27/17	17:18	07:31	Duplicate
ZZZZZZ	3A157655.D	09/27/17	17:43	07:56	(unrelated sample)
JC51376-4MS	3A157656.D	09/27/17	18:09	08:22	Matrix Spike
JC51468-2	3A157658.D	09/27/17	19:02	09:15	(used for QC only; not part of job JC52931)
ZZZZZZ	3A157659.D	09/27/17	19:28	09:41	(unrelated sample)
JC51468-5	3A157660.D	09/27/17	19:54	10:07	(used for QC only; not part of job JC52931)
JC51468-5DUP	3A157661.D	09/27/17	20:27	10:40	Duplicate
JC51468-2MS	3A157662.D	09/27/17	20:54	11:07	Matrix Spike

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC52931

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6794-BFB	Injection Date:	10/12/17
Lab File ID:	3A157835.D	Injection Time:	13:02
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	7288	19.7	Pass
75	30.0 - 60.0% of mass 95	19456	52.7	Pass
95	Base peak, 100% relative abundance	36909	100.0	Pass
96	5.0 - 9.0% of mass 95	2523	6.84	Pass
173	Less than 2.0% of mass 174	207	0.56	(0.84) ^a Pass
174	50.0 - 120.0% of mass 95	24664	66.8	Pass
175	5.0 - 9.0% of mass 174	1778	4.82	(7.21) ^a Pass
176	95.0 - 101.0% of mass 174	23938	64.9	(97.1) ^a Pass
177	5.0 - 9.0% of mass 176	1474	3.99	(6.16) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6794-CC6787	3A157836.D	10/12/17	13:32	00:30	Continuing cal 5
V3A6794-MB	3A157838.D	10/12/17	14:47	01:45	Method Blank
V3A6794-BS	3A157839.D	10/12/17	15:13	02:11	Blank Spike
JC52931-6	3A157841.D	10/12/17	16:04	03:02	RW-1210SSTA-100917
JC52931-11	3A157842.D	10/12/17	16:30	03:28	RW-1408PTC-101017
JC52931-3	3A157843.D	10/12/17	16:56	03:54	RW-7921BHC-100917-F
JC52931-4	3A157844.D	10/12/17	17:21	04:19	RW-7921BHC-100917
JC52931-5	3A157845.D	10/12/17	17:47	04:45	RW-100
JC52931-7	3A157847.D	10/12/17	18:13	05:11	RW-919RMD-101017
JC52931-9	3A157848.D	10/12/17	18:39	05:37	RW-853RR--101017
JC52931-10	3A157849.D	10/12/17	19:05	06:03	RW-200
JC52931-1	3A157850.D	10/12/17	19:31	06:29	TB-101017
JC52931-12	3A157851.D	10/12/17	19:57	06:55	RW-1217SPC-101017
JC52931-13	3A157852.D	10/12/17	20:22	07:20	RW-1217SPC-101017-F
JC52931-14	3A157853.D	10/12/17	20:48	07:46	RW-1201SSTA-101017
JC52931-15	3A157854.D	10/12/17	21:13	08:11	RW-1201SSTA-101017-F
JC52931-8	3A157855.D	10/12/17	21:39	08:37	RW-919RMD-101017-F
JC52931-6DUP	3A157856.D	10/12/17	22:05	09:03	Duplicate
JC52931-11MS	3A157857.D	10/12/17	22:31	09:29	Matrix Spike

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC52931-1	1B112110.D	93	83
JC52931-2	1B112111.D	92	83
JC52931-3	1B112112.D	94	84
JC52931-4	1B112113.D	93	82
JC52931-5	1B112117.D	92	81
JC52931-7	1B112118.D	94	83
JC52931-8	1B112119.D	93	81
JC52931-9	1B112120.D	93	81
JC52931-10	1B112121.D	90	79
JC52931-11	1B112122.D	90	80
JC52931-12	1B112123.D	90	80
JC52931-13	1B112124.D	92	80
JC52931-14	1B112125.D	89	77
JC52931-15	1B112160.D	94	83
JC52931-2MS	1B112114.D	102	93
JC52931-3DUP	1B112115.D	94	84
JC52982-1DUP	1B112166.D	95	81
JC53135-1MS	1B112168.D	103	94
V1B5347-BS	1B112107.D	102	94
V1B5347-BSD	1B112108.D	102	94
V1B5347-MB	1B112106.D	97	87
V1B5351-BS	1B112159.D	104	93
V1B5351-MB	1B112158.D	93	84

Surrogate Compounds	Recovery Limits
S1 = 1,2-Dichlorobenzene-d4	70-130%
S2 = 4-Bromofluorobenzene	70-130%

6.7.1
6

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC52931

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC52931-1	3A157850.D	112
JC52931-3	3A157843.D	110
JC52931-4	3A157844.D	112
JC52931-5	3A157845.D	110
JC52931-6	3A157841.D	110
JC52931-7	3A157847.D	109
JC52931-8	3A157855.D	115
JC52931-9	3A157848.D	119
JC52931-10	3A157849.D	116
JC52931-11	3A157842.D	100
JC52931-12	3A157851.D	115
JC52931-13	3A157852.D	115
JC52931-14	3A157853.D	115
JC52931-15	3A157854.D	118
JC52931-11MS	3A157857.D	118
JC52931-6DUP	3A157856.D	117
V3A6794-BS	3A157839.D	99
V3A6794-MB	3A157838.D	95

Surrogate
Compounds

Recovery
Limits

S1 = 1,4-Dioxane-d8

51-175%

6.7.2
6



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Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

31400389/03

SGS Accutest Job Number: JC53497

Sampling Date: 10/18/17



Report to:

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Nancy F. Cole

**Nancy Cole
Laboratory Director**

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Sample Summary

WSP Environment & Energy

Job No: JC53497

Kop-Flex, Hanover, VA
Project No: 31400389/03

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID	
JC53497-1	10/18/17	15:05 MJK	10/19/17	DW	Drinking Water TB	TB_161817
JC53497-2	10/18/17	15:05 MJK	10/19/17	DW	Drinking Water	RW_7742TO-101817
JC53497-3	10/18/17	14:00 MJK	10/19/17	DW	Drinking Water	RW_907REE-101817
JC53497-4	10/18/17	14:05 MJK	10/19/17	DW	Drinking Water	RW-907REE-101817-F

Summary of Hits

Job Number: JC53497
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 10/18/17

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC53497-1	TB_161817					
Acetone		10.8	5.0	3.8	ug/l	EPA 524.2 REV 4.1
JC53497-2	RW_7742TO-101817					
1,1-Dichloroethylene		2.8	0.50	0.23	ug/l	EPA 524.2 REV 4.1
1,1,1-Trichloroethane		0.18 J	0.50	0.12	ug/l	EPA 524.2 REV 4.1
1,4-Dioxane		1.3	0.40	0.29	ug/l	SW846 8260C BY SIM
JC53497-3	RW_907REE-101817					
1,2-Dichloroethane		0.49 J	0.50	0.28	ug/l	EPA 524.2 REV 4.1
Methyl Tert Butyl Ether		2.3	0.50	0.080	ug/l	EPA 524.2 REV 4.1
JC53497-4	RW-907REE-101817-F					
1,2-Dichloroethane		0.38 J	0.50	0.28	ug/l	EPA 524.2 REV 4.1
Methyl Tert Butyl Ether		2.0	0.50	0.080	ug/l	EPA 524.2 REV 4.1

Sample Results

Report of Analysis

Report of Analysis

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Client Sample ID:	TB_161817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-1	Date Received:	10/19/17
Matrix:	DW - Drinking Water TB	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1B112333.D	1	10/30/17 12:56	BK	n/a	n/a	V1B5364
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
67-64-1	Acetone	10.8		5.0	3.8	ug/l	
78-93-3	2-Butanone	ND		5.0	2.5	ug/l	
71-43-2	Benzene	ND	5.0	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND		0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND		0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND		0.50	0.36	ug/l	
75-25-2	Bromoform ^a	ND		0.50	0.40	ug/l	
74-83-9	Bromomethane	ND		0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND		0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND		0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND		0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND		0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	100	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND		0.50	0.071	ug/l	
67-66-3	Chloroform	ND		0.50	0.33	ug/l	
74-87-3	Chloromethane	ND		0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND		0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND		0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride ^a	ND	5.0	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND		0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	7.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND		0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropan ^a	ND		0.20	1.0	0.25	ug/l
106-93-4	1,2-Dibromoethane	ND		0.050	0.50	0.29	ug/l
107-06-2	1,2-Dichloroethane	ND		5.0	0.50	0.28	ug/l
78-87-5	1,2-Dichloropropane	ND	5.0	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND		0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND		0.50	0.24	ug/l	
124-48-1	Dibromochloromethane ^a	ND		0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND		0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane ^b	ND		0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND		0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 141)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TB_161817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-1	Date Received:	10/19/17
Matrix:	DW - Drinking Water TB	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	600	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	75	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	70	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND		0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND		0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	700	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene ^a	ND		0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND		2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND		0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND		0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	5.0	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND		0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND		2.0	1.5	ug/l	
91-20-3	Naphthalene	ND		0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND		0.50	0.26	ug/l	
100-42-5	Styrene	ND	100	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND		0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	200	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND		0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND		0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	70	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND		0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND		0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	5.0	0.50	0.12	ug/l	
108-88-3	Toluene	ND	1000	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	5.0	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND		1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.50	0.056	ug/l	
	m,p-Xylene	ND		0.50	0.26	ug/l	
95-47-6	o-Xylene	ND		0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	10000	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	101%		70-130%
460-00-4	4-Bromofluorobenzene	92%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 141)

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3.1

3

Client Sample ID:	TB_161817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-1	Date Received:	10/19/17
Matrix:	DW - Drinking Water TB	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
---------	----------	--------	-----	----	-----	-------	---

- (a) This compound in BS is outside in house QC limits bias high.
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

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Client Sample ID:	TB_161817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-1	Date Received:	10/19/17
Matrix:	DW - Drinking Water TB	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157883.D	1	10/23/17 12:27	PR	n/a	n/a	V3A6796
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND		0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits							
17647-74-4	1,4-Dioxane-d8	108%			51-175%		

ND = Not detected MCL = Method Detection Limit
 MCL = Maximum Contamination Level (40 CFR 141)
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW_7742TO-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-2	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		
Run #1	File ID 1B112230.D	DF 1	Analyzed 10/24/17 00:26
Run #2			By BK
			Prep Date n/a
			Prep Batch n/a
			Analytical Batch V1B5358
	Purge Volume Run #1 5.0 ml		
	Run #2		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
67-64-1	Acetone ^a	ND		5.0	3.8	ug/l	
78-93-3	2-Butanone	ND		5.0	2.5	ug/l	
71-43-2	Benzene	ND	5.0	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND		0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND		0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND		0.50	0.36	ug/l	
75-25-2	Bromoform	ND		0.50	0.40	ug/l	
74-83-9	Bromomethane	ND		0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND		0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND		0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND		0.50	0.25	ug/l	
75-15-0	Carbon disulfide ^b	ND		0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	100	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND		0.50	0.071	ug/l	
67-66-3	Chloroform	ND		0.50	0.33	ug/l	
74-87-3	Chloromethane	ND		0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND		0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND		0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	5.0	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND		0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	2.8	7.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND		0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND		0.20	1.0	0.25	ug/l
106-93-4	1,2-Dibromoethane	ND		0.050	0.50	0.29	ug/l
107-06-2	1,2-Dichloroethane	ND		5.0	0.50	0.28	ug/l
78-87-5	1,2-Dichloropropane	ND	5.0	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND		0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND		0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND		0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND		0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND		0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND		0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 141)

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW_7742TO-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-2	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	600	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	75	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	70	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND		0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND		0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	700	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND		0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND		2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND		0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND		0.50	0.23	ug/l	
75-09-2	Methylene chloride b	ND	5.0	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND		0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND		2.0	1.5	ug/l	
91-20-3	Naphthalene	ND		0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND		0.50	0.26	ug/l	
100-42-5	Styrene	ND	100	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND		0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.18	200	0.50	0.12	ug/l	J
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND		0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND		0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	70	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND		0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND		0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	5.0	0.50	0.12	ug/l	
108-88-3	Toluene	ND	1000	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	5.0	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND		1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.50	0.056	ug/l	
	m,p-Xylene	ND		0.50	0.26	ug/l	
95-47-6	o-Xylene	ND		0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	10000	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	95%		70-130%
460-00-4	4-Bromofluorobenzene	78%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 141)

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW_7742TO-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-2	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
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- (a) Associated CCV and BS outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW_7742TO-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-2	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157884.D	1	10/23/17 12:53	PR	n/a	n/a	V3A6796
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	1.3		0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits							
17647-74-4	1,4-Dioxane-d8	109%			51-175%		

ND = Not detected MDL = Method Detection Limit
 MCL = Maximum Contamination Level (40 CFR 141)
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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Client Sample ID: RW_907REE-101817
 Lab Sample ID: JC53497-3
 Matrix: DW - Drinking Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/18/17
 Date Received: 10/19/17
 Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1B112231.D	1	10/24/17 00:58	BK	n/a	n/a	V1B5358
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
67-64-1	Acetone ^a	ND		5.0	3.8	ug/l	
78-93-3	2-Butanone	ND		5.0	2.5	ug/l	
71-43-2	Benzene	ND	5.0	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND		0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND		0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND		0.50	0.36	ug/l	
75-25-2	Bromoform	ND		0.50	0.40	ug/l	
74-83-9	Bromomethane	ND		0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND		0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND		0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND		0.50	0.25	ug/l	
75-15-0	Carbon disulfide ^b	ND		0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	100	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND		0.50	0.071	ug/l	
67-66-3	Chloroform	ND		0.50	0.33	ug/l	
74-87-3	Chloromethane	ND		0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND		0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND		0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	5.0	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND		0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	7.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND		0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND		0.20	1.0	ug/l	
106-93-4	1,2-Dibromoethane	ND		0.050	0.50	0.29	
107-06-2	1,2-Dichloroethane	0.49	5.0	0.50	0.28	ug/l	J
78-87-5	1,2-Dichloropropane	ND	5.0	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND		0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND		0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND		0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND		0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND		0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND		0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 141)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW_907REE-101817
 Lab Sample ID: JC53497-3
 Matrix: DW - Drinking Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 10/18/17
 Date Received: 10/19/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	600	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	75	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	70	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND		0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND		0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	700	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND		0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND		2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND		0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND		0.50	0.23	ug/l	
75-09-2	Methylene chloride b	ND	5.0	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	2.3		0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND		2.0	1.5	ug/l	
91-20-3	Naphthalene	ND		0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND		0.50	0.26	ug/l	
100-42-5	Styrene	ND	100	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND		0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	200	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND		0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND		0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	70	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND		0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND		0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	5.0	0.50	0.12	ug/l	
108-88-3	Toluene	ND	1000	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	5.0	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND		1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.50	0.056	ug/l	
	m,p-Xylene	ND		0.50	0.26	ug/l	
95-47-6	o-Xylene	ND		0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	10000	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 141)

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW_907REE-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-3	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
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- (a) Associated CCV and BS outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW_907REE-101817	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-3	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A157885.D	DF 1	Analyzed 10/23/17 13:18	By PR	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6796
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND		0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits			
17647-74-4	1,4-Dioxane-d8	107%		51-175%			

ND = Not detected MCL = Method Detection Limit
 MCL = Maximum Contamination Level (40 CFR 141)
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-907REE-101817-F	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-4	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		
Run #1	File ID 1B112232.D	DF 1	Analyzed 10/24/17 01:30 By BK Prep Date n/a Prep Batch n/a Analytical Batch V1B5358
Run #2			
	Purge Volume Run #1 5.0 ml		
Run #2			

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
67-64-1	Acetone ^a	ND		5.0	3.8	ug/l	
78-93-3	2-Butanone	ND		5.0	2.5	ug/l	
71-43-2	Benzene	ND	5.0	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND		0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND		0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND		0.50	0.36	ug/l	
75-25-2	Bromoform	ND		0.50	0.40	ug/l	
74-83-9	Bromomethane	ND		0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND		0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND		0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND		0.50	0.25	ug/l	
75-15-0	Carbon disulfide ^b	ND		0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	100	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND		0.50	0.071	ug/l	
67-66-3	Chloroform	ND		0.50	0.33	ug/l	
74-87-3	Chloromethane	ND		0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND		0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND		0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	5.0	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND		0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	7.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND		0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND		0.20	1.0	ug/l	
106-93-4	1,2-Dibromoethane	ND		0.050	0.50	0.29	
107-06-2	1,2-Dichloroethane	0.38	5.0	0.50	0.28	ug/l	J
78-87-5	1,2-Dichloropropane	ND	5.0	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND		0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND		0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND		0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND		0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND		0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND		0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

MCL = Maximum Contamination Level (40 CFR 141)

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-907REE-101817-F	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-4	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	600	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	75	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	70	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND		0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND		0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	700	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND		0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND		2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND		0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND		0.50	0.23	ug/l	
75-09-2	Methylene chloride b	ND	5.0	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	2.0		0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND		2.0	1.5	ug/l	
91-20-3	Naphthalene	ND		0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND		0.50	0.26	ug/l	
100-42-5	Styrene	ND	100	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND		0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	200	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND		0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND		0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND		0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	70	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND		0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND		0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	5.0	0.50	0.12	ug/l	
108-88-3	Toluene	ND	1000	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	5.0	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND		1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	2.0	0.50	0.056	ug/l	
	m,p-Xylene	ND		0.50	0.26	ug/l	
95-47-6	o-Xylene	ND		0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	10000	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

MCL = Maximum Contamination Level (40 CFR 141)

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-907REE-101817-F	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-4	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
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- (a) Associated CCV and BS outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-907REE-101817-F	Date Sampled:	10/18/17
Lab Sample ID:	JC53497-4	Date Received:	10/19/17
Matrix:	DW - Drinking Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157886.D	1	10/23/17 13:44	PR	n/a	n/a	V3A6796
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND		0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits							
17647-74-4	1,4-Dioxane-d8	113%			51-175%		

ND = Not detected MCL = Method Detection Limit
 MCL = Maximum Contamination Level (40 CFR 141)
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

DW
ACCUTEST WTB

CHAIN OF CUSTODY

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

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FED-EX Tracking # 725069314170
Bottle Order Control #
SGS Accutest Quote #
SGS Accutest Job # JC53497

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes	
Company Name WSP	Project Name: Kopflex, Hanover, MD	Street Address 13530 Dulles Technology Drive, Ste 300	Street	Billing Information (if different from Report to)	Company Name	DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment Oil - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
City State Zip Hanover, VA 20131	City State Zip	Project Contact Eric Johnson	E-mail eric.johnson@wsp.com	Project # 31400389/03	Street Address		
Phone # 703-709-6500	Fax #	Client Purchase Order #	City	State Zip			
Sampler(s) Name(s) Manakaplan + David Dickerson	Phone #	Project Manager	Attention:				
		Collection		Number of preserved Bottles			
SGS Accutest Sample #	Field ID / Point of Collection	MEOH/HD Vial #	Date	Time	Sampled by	Matrix	# of bottles
1	TB-101817		—	—	—	DW	4 X
2	RW-774270-101817		10/10/17	1505	45X	DW	6 Y
3	RW-907REE-101817		10/10/17	1400	15X	DW	6 X
4	RW-907REE-101817-F		10/10/17	1405	15X	DW	6 X
VOCs (EPA 524) 1-HDioxane 1626051m							
LAB USE ONLY							
V1192							
Turnaround Time (Business days)		Data Deliverable Information				Comments / Special Instructions	
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting				<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format _____ <input type="checkbox"/> Other _____	
NJ Reduced = Results + QC Summary + Partial Raw data							
Sample inventory is verified upon receipt in the Laboratory							
Sample Custody must be documented below each time samples change possession, including courier delivery.							
Relinquished by Sampler: 1	Date Time: 10/10/17 1630	Received By: FX	Relinquished By: 2	Date Time: 10/10/17 9:15	Received By: FX	Received By: 2	Received By: 2
Relinquished by Sampler: 3	Date Time: 10/10/17 1630	Received By: 3	Relinquished By: 4	Date Time: 10/10/17 9:15	Received By: 4	Received By: 4	Received By: 4
Relinquished by: 5	Date Time: 10/10/17 1630	Received By: 5	Custody Seal # /	Intact <input checked="" type="checkbox"/> Not intact <input type="checkbox"/>	Preserved where applicable <input type="checkbox"/>	On Ice <input type="checkbox"/>	Cooler Temp. 3.14

Form:SM088-01CRev.Date:9/13/16

JC53497: Chain of Custody

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SGS Accutest Sample Receipt Summary

Job Number: JC53497 Client: _____ Project: _____
 Date / Time Received: 10/19/2017 9:15:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (3.1);

Cooler Temps (Corrected) °C: Cooler 1: (1.5);

Cooler Security	<u>Y or N</u>	<u>Y or N</u>	Sample Integrity - Documentation	<u>Y or N</u>		
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
Cooler Temperature		<u>Y or N</u>	Sample Integrity - Condition			
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact		
4. No. Coolers:	1					
Quality Control Preservation		<u>Y or N</u>	<u>N/A</u>	Sample Integrity - Instructions	<u>Y or N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	
			5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments

SM089-02
Rev. Date 12/1/16

JC53497: Chain of Custody

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MS Volatiles**QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-MB	1B112228.D	1	10/23/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-MB	1B112228.D	1	10/23/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No. Surrogate Recoveries Limits

2199-69-1	1,2-Dichlorobenzene-d4	94%	70-130%
460-00-4	4-Bromofluorobenzene	78%	70-130%

5.1.1
5

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-MB	1B112329.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-MB	1B112329.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No. Surrogate Recoveries Limits

2199-69-1	1,2-Dichlorobenzene-d4	101%	70-130%
460-00-4	4-Bromofluorobenzene	94%	70-130%

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-MB	1B112329.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method:

JC53497-1

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-MB2	1B112273.D	1	10/25/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-3DUP

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-MB2	1B112273.D	1	10/25/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-3DUP

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No. Surrogate Recoveries Limits

2199-69-1	1,2-Dichlorobenzene-d4	98%	70-130%
460-00-4	4-Bromofluorobenzene	98%	70-130%

Method Blank Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6796-MB	3A157880.D	1	10/23/17	PR	n/a	n/a	V3A6796

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC53497-1, JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8	103% 51-175%

5.1.4
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Blank Spike Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-BS	1B112229.D	1	10/23/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	26.4	132* ^a	70-130
78-93-3	2-Butanone	20	18.8	94	70-130
71-43-2	Benzene	5	4.9	98	70-130
108-86-1	Bromobenzene	5	4.9	98	70-130
74-97-5	Bromochloromethane	5	5.3	106	70-130
75-27-4	Bromodichloromethane	5	5.2	104	70-130
75-25-2	Bromoform	5	5.7	114	70-130
74-83-9	Bromomethane	2	2.3	115	70-130
104-51-8	n-Butylbenzene	5	3.7	74	70-130
135-98-8	sec-Butylbenzene	5	3.9	78	70-130
98-06-6	tert-Butylbenzene	5	3.6	72	70-130
75-15-0	Carbon disulfide	5	6.3	126	70-130
108-90-7	Chlorobenzene	5	5.0	100	70-130
75-00-3	Chloroethane	2	2.3	115	70-130
67-66-3	Chloroform	5	5.3	106	70-130
74-87-3	Chloromethane	2	2.1	105	70-130
95-49-8	o-Chlorotoluene	5	4.4	88	70-130
106-43-4	p-Chlorotoluene	5	4.4	88	70-130
56-23-5	Carbon tetrachloride	5	5.3	106	70-130
75-34-3	1,1-Dichloroethane	5	5.2	104	70-130
75-35-4	1,1-Dichloroethylene	5	5.6	112	70-130
563-58-6	1,1-Dichloropropene	5	4.3	86	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	5.1	102	70-130
106-93-4	1,2-Dibromoethane	5	4.9	98	70-130
107-06-2	1,2-Dichloroethane	5	5.2	104	70-130
78-87-5	1,2-Dichloropropane	5	5.1	102	70-130
142-28-9	1,3-Dichloropropane	5	5.4	108	70-130
594-20-7	2,2-Dichloropropane	5	5.0	100	70-130
124-48-1	Dibromochloromethane	5	5.6	112	70-130
74-95-3	Dibromomethane	5	5.6	112	70-130
75-71-8	Dichlorodifluoromethane	2	1.6	80	70-130
541-73-1	m-Dichlorobenzene	5	5.1	102	70-130
95-50-1	o-Dichlorobenzene	5	5.0	100	70-130
106-46-7	p-Dichlorobenzene	5	4.8	96	70-130
156-60-5	trans-1,2-Dichloroethylene	5	4.5	90	70-130
156-59-2	cis-1,2-Dichloroethylene	5	4.5	90	70-130

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

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Job Number: JC53497
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-BS	1B112229.D	1	10/23/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	4.1	82	70-130
10061-02-6	trans-1,3-Dichloropropene	5	4.8	96	70-130
100-41-4	Ethylbenzene	5	4.3	86	70-130
87-68-3	Hexachlorobutadiene	5	4.8	96	70-130
591-78-6	2-Hexanone	20	17.3	87	70-130
98-82-8	Isopropylbenzene	5	3.6	72	70-130
99-87-6	p-Isopropyltoluene	5	3.8	76	70-130
75-09-2	Methylene chloride	5	6.4	128	70-130
1634-04-4	Methyl Tert Butyl Ether	5	3.8	79	70-130
108-10-1	4-Methyl-2-pentanone	20	19.1	96	70-130
91-20-3	Naphthalene	5	3.6	72	70-130
103-65-1	n-Propylbenzene	5	4.2	84	70-130
100-42-5	Styrene	5	4.2	84	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	5.4	108	70-130
71-55-6	1,1,1-Trichloroethane	5	4.9	98	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	5.4	108	70-130
79-00-5	1,1,2-Trichloroethane	5	5.2	104	70-130
87-61-6	1,2,3-Trichlorobenzene	5	4.2	84	70-130
96-18-4	1,2,3-Trichloropropane	5	5.5	110	70-130
120-82-1	1,2,4-Trichlorobenzene	5	4.0	80	70-130
95-63-6	1,2,4-Trimethylbenzene	5	4.2	84	70-130
108-67-8	1,3,5-Trimethylbenzene	5	4.3	86	70-130
127-18-4	Tetrachloroethylene	5	4.8	96	70-130
108-88-3	Toluene	5	4.2	84	70-130
79-01-6	Trichloroethylene	5	4.8	96	70-130
75-69-4	Trichlorofluoromethane	2	2.1	105	70-130
75-01-4	Vinyl chloride	2	1.9	95	70-130
	m,p-Xylene	10	8.9	89	70-130
95-47-6	o-Xylene	5	4.1	82	70-130
1330-20-7	Xylenes (total)	15	13.0	87	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	107%	70-130%
460-00-4	4-Bromofluorobenzene	87%	70-130%

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

Job Number: JC53497
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5358-BS	1B112229.D	1	10/23/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6796-BS	3A157881.D	1	10/23/17	PR	n/a	n/a	V3A6796

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC53497-1, JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
123-91-1	1,4-Dioxane	20	20.1	101	58-138

CAS No.	Surrogate Recoveries	BSP	Limits
17647-74-4	1,4-Dioxane-d8	102%	51-175%

* = Outside of Control Limits.

5.2.2

Blank Spike/Blank Spike Duplicate Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-BS	1B112330.D	1	10/30/17	BK	n/a	n/a	V1B5364
V1B5364-BSD	1B112331.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	20	25.7	129	25.3	127	2	70-130/30
78-93-3	2-Butanone	20	24.3	122	23.9	120	2	70-130/30
71-43-2	Benzene	5	5.9	118	5.8	116	2	70-130/30
108-86-1	Bromobenzene	5	6.1	122	5.9	118	3	70-130/30
74-97-5	Bromochloromethane	5	6.5	130	6.5	130	0	70-130/30
75-27-4	Bromodichloromethane	5	6.4	128	6.3	126	2	70-130/30
75-25-2	Bromoform	5	7.3	146* a	7.1	142* a	3	70-130/30
74-83-9	Bromomethane	2	1.9	95	2.0	100	5	70-130/30
104-51-8	n-Butylbenzene	5	6.0	120	5.7	114	5	70-130/30
135-98-8	sec-Butylbenzene	5	6.0	120	5.8	116	3	70-130/30
98-06-6	tert-Butylbenzene	5	5.8	116	5.7	114	2	70-130/30
75-15-0	Carbon disulfide	5	6.3	126	6.1	122	3	70-130/30
108-90-7	Chlorobenzene	5	6.1	122	5.9	118	3	70-130/30
75-00-3	Chloroethane	2	1.9	95	1.8	90	5	70-130/30
67-66-3	Chloroform	5	6.1	122	5.9	118	3	70-130/30
74-87-3	Chloromethane	2	2.0	100	2.0	100	0	70-130/30
95-49-8	o-Chlorotoluene	5	6.1	122	6.0	120	2	70-130/30
106-43-4	p-Chlorotoluene	5	5.8	116	5.8	116	0	70-130/30
56-23-5	Carbon tetrachloride	5	6.7	134* a	6.4	128	5	70-130/30
75-34-3	1,1-Dichloroethane	5	6.1	122	6.0	120	2	70-130/30
75-35-4	1,1-Dichloroethylene	5	6.2	124	6.1	122	2	70-130/30
563-58-6	1,1-Dichloropropene	5	5.9	118	5.8	116	2	70-130/30
96-12-8	1,2-Dibromo-3-chloropropane	5	6.7	134* a	6.2	124	8	70-130/30
106-93-4	1,2-Dibromoethane	5	6.0	120	6.0	120	0	70-130/30
107-06-2	1,2-Dichloroethane	5	6.1	122	6.1	122	0	70-130/30
78-87-5	1,2-Dichloropropane	5	6.2	124	5.9	118	5	70-130/30
142-28-9	1,3-Dichloropropane	5	6.2	124	6.0	120	3	70-130/30
594-20-7	2,2-Dichloropropane	5	6.3	126	6.1	122	3	70-130/30
124-48-1	Dibromochloromethane	5	6.7	134* a	6.6	132* a	2	70-130/30
74-95-3	Dibromomethane	5	6.3	126	6.2	124	2	70-130/30
75-71-8	Dichlorodifluoromethane	2	2.1	105	2.1	105	0	70-130/30
541-73-1	m-Dichlorobenzene	5	6.2	124	6.0	120	3	70-130/30
95-50-1	o-Dichlorobenzene	5	6.3	126	6.0	120	5	70-130/30
106-46-7	p-Dichlorobenzene	5	6.2	124	5.9	118	5	70-130/30
156-60-5	trans-1,2-Dichloroethylene	5	5.8	116	5.6	112	4	70-130/30
156-59-2	cis-1,2-Dichloroethylene	5	5.8	116	5.6	112	4	70-130/30

* = Outside of Control Limits.

5.3.1
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Blank Spike/Blank Spike Duplicate Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-BS	1B112330.D	1	10/30/17	BK	n/a	n/a	V1B5364
V1B5364-BSD	1B112331.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	5	5.9	118	5.7	114	3	70-130/30
10061-02-6	trans-1,3-Dichloropropene	5	6.2	124	6.1	122	2	70-130/30
100-41-4	Ethylbenzene	5	5.9	118	5.7	114	3	70-130/30
87-68-3	Hexachlorobutadiene	5	6.6	132* a	6.3	126	5	70-130/30
591-78-6	2-Hexanone	20	23.7	119	23.3	117	2	70-130/30
98-82-8	Isopropylbenzene	5	5.8	116	5.6	112	4	70-130/30
99-87-6	p-Isopropyltoluene	5	6.0	120	5.8	116	3	70-130/30
75-09-2	Methylene chloride	5	6.2	124	6.1	122	2	70-130/30
1634-04-4	Methyl Tert Butyl Ether	50	5.5	110	5.4	108	2	70-130/30
108-10-1	4-Methyl-2-pentanone	20	24.1	121	23.7	119	2	70-130/30
91-20-3	Naphthalene	5	6.1	122	6.0	120	2	70-130/30
103-65-1	n-Propylbenzene	5	5.9	118	5.8	116	2	70-130/30
100-42-5	Styrene	5	5.7	114	5.6	112	2	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	5	6.3	126	6.2	124	2	70-130/30
71-55-6	1,1,1-Trichloroethane	5	6.3	126	6.0	120	5	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	5	6.4	128	6.2	124	3	70-130/30
79-00-5	1,1,2-Trichloroethane	5	6.1	122	6.0	120	2	70-130/30
87-61-6	1,2,3-Trichlorobenzene	5	6.4	128	6.2	124	3	70-130/30
96-18-4	1,2,3-Trichloropropane	5	6.5	130	6.3	126	3	70-130/30
120-82-1	1,2,4-Trichlorobenzene	5	6.4	128	6.1	122	5	70-130/30
95-63-6	1,2,4-Trimethylbenzene	5	6.0	120	5.8	116	3	70-130/30
108-67-8	1,3,5-Trimethylbenzene	5	5.9	118	5.7	114	3	70-130/30
127-18-4	Tetrachloroethylene	5	6.3	126	6.1	122	3	70-130/30
108-88-3	Toluene	5	5.9	118	5.7	114	3	70-130/30
79-01-6	Trichloroethylene	5	6.1	122	6.0	120	2	70-130/30
75-69-4	Trichlorofluoromethane	2	1.9	95	1.9	95	0	70-130/30
75-01-4	Vinyl chloride	2	1.9	95	1.9	95	0	70-130/30
	m,p-Xylene	10	11.9	119	11.6	116	3	70-130/30
95-47-6	o-Xylene	5	5.9	118	5.7	114	3	70-130/30
1330-20-7	Xylenes (total)	15	17.8	119	17.3	115	3	70-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
2199-69-1	1,2-Dichlorobenzene-d4	105%	105%	70-130%
460-00-4	4-Bromofluorobenzene	97%	97%	70-130%

* = Outside of Control Limits.

5.3.1
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Blank Spike/Blank Spike Duplicate Summary

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Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5364-BS	1B112330.D	1	10/30/17	BK	n/a	n/a	V1B5364
V1B5364-BSD	1B112331.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

5.3.1
5

Matrix Spike Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53497-2MS	1B112235.D	1	10/24/17	BK	n/a	n/a	V1B5358
JC53497-2	1B112230.D	1	10/24/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

5.4.1
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JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	JC53497-2 ug/l	Spike Q	MS ug/l	MS %	Limits
67-64-1	Acetone	ND	20	22.1	111	41-142
78-93-3	2-Butanone	ND	20	15.8	79	55-129
71-43-2	Benzene	ND	5	3.7	74	53-138
108-86-1	Bromobenzene	ND	5	3.5	70	54-138
74-97-5	Bromochloromethane	ND	5	4.1	82	55-140
75-27-4	Bromodichloromethane	ND	5	3.8	76	57-147
75-25-2	Bromoform	ND	5	4.4	88	47-137
74-83-9	Bromomethane	ND	2	2.3	115	40-162
104-51-8	n-Butylbenzene	ND	5	2.6	52	45-144
135-98-8	sec-Butylbenzene	ND	5	2.8	56	46-145
98-06-6	tert-Butylbenzene	ND	5	2.5	50	48-141
75-15-0	Carbon disulfide	ND	5	4.8	96	35-127
108-90-7	Chlorobenzene	ND	5	3.4	68	54-135
75-00-3	Chloroethane	ND	2	2.4	120	38-153
67-66-3	Chloroform	ND	5	3.9	78	57-151
74-87-3	Chloromethane	ND	2	2.4	120	39-165
95-49-8	o-Chlorotoluene	ND	5	3.0	60	55-142
106-43-4	p-Chlorotoluene	ND	5	3.0	60	55-139
56-23-5	Carbon tetrachloride	ND	5	4.1	82	49-170
75-34-3	1,1-Dichloroethane	ND	5	4.0	80	55-149
75-35-4	1,1-Dichloroethylene	2.8	5	5.9	62	42-142
563-58-6	1,1-Dichloropropene	ND	5	3.3	66	46-151
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	4.1	82	48-141
106-93-4	1,2-Dibromoethane	ND	5	3.5	70	57-135
107-06-2	1,2-Dichloroethane	ND	5	3.9	78	59-166
78-87-5	1,2-Dichloropropane	ND	5	3.7	74	53-142
142-28-9	1,3-Dichloropropane	ND	5	4.0	80	58-143
594-20-7	2,2-Dichloropropane	ND	5	4.1	82	38-165
124-48-1	Dibromochloromethane	ND	5	4.1	82	55-138
74-95-3	Dibromomethane	ND	5	4.0	80	61-144
75-71-8	Dichlorodifluoromethane	ND	2	2.0	100	23-172
541-73-1	m-Dichlorobenzene	ND	5	3.5	70	53-138
95-50-1	o-Dichlorobenzene	ND	5	3.4	68	54-140
106-46-7	p-Dichlorobenzene	ND	5	3.3	66	53-137
156-60-5	trans-1,2-Dichloroethylene	ND	5	3.6	72	47-148
156-59-2	cis-1,2-Dichloroethylene	ND	5	3.4	68	51-146

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53497-2MS	1B112235.D	1	10/24/17	BK	n/a	n/a	V1B5358
JC53497-2	1B112230.D	1	10/24/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

5.4.1
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JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	ug/l	JC53497-2 Q	Spike ug/l	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND		5	3.1	62	51-136
10061-02-6	trans-1,3-Dichloropropene	ND		5	3.5	70	54-142
100-41-4	Ethylbenzene	ND		5	3.0	60	51-138
87-68-3	Hexachlorobutadiene	ND		5	3.6	72	40-154
591-78-6	2-Hexanone	ND		20	14.1	71	53-128
98-82-8	Isopropylbenzene	ND		5	2.5	50	49-139
99-87-6	p-Isopropyltoluene	ND		5	2.6	52	45-141
75-09-2	Methylene chloride	ND		5	4.2	84	54-137
1634-04-4	Methyl Tert Butyl Ether	ND		5	3.1	62	53-143
108-10-1	4-Methyl-2-pentanone	ND		20	15.4	77	58-127
91-20-3	Naphthalene	ND		5	2.6	52	44-140
103-65-1	n-Propylbenzene	ND		5	2.9	58	50-142
100-42-5	Styrene	ND		5	2.7	54	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND		5	3.9	78	57-144
71-55-6	1,1,1-Trichloroethane	0.18	J	5	4.0	76	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND		5	4.1	82	58-138
79-00-5	1,1,2-Trichloroethane	ND		5	3.9	78	59-139
87-61-6	1,2,3-Trichlorobenzene	ND		5	3.0	60	47-141
96-18-4	1,2,3-Trichloropropane	ND		5	4.2	84	56-148
120-82-1	1,2,4-Trichlorobenzene	ND		5	2.8	56	46-137
95-63-6	1,2,4-Trimethylbenzene	ND		5	2.8	56	41-138
108-67-8	1,3,5-Trimethylbenzene	ND		5	2.8	56	45-138
127-18-4	Tetrachloroethylene	ND		5	3.5	70	45-145
108-88-3	Toluene	ND		5	3.1	62	52-134
79-01-6	Trichloroethylene	ND		5	3.6	72	54-143
75-69-4	Trichlorofluoromethane	ND		2	2.1	105	36-167
75-01-4	Vinyl chloride	ND		2	2.3	115	35-162
	m,p-Xylene	ND		10	5.9	59	49-135
95-47-6	o-Xylene	ND		5	2.8	56	49-134
1330-20-7	Xylenes (total)	ND		15	8.7	58	50-134

CAS No.	Surrogate Recoveries	MS	JC53497-2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	108%	95%	70-130%
460-00-4	4-Bromofluorobenzene	89%	78%	70-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53728-1MS	1B112341.D	1	10/30/17	BK	n/a	n/a	V1B5364
JC53728-1	1B112334.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

5.4.2

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JC53497-1

CAS No.	Compound	JC53728-1 ug/l	Spike Q	MS ug/l	MS %	Limits
67-64-1	Acetone	ND	20	18.4	92	41-142
78-93-3	2-Butanone	ND	20	15.3	77	55-129
71-43-2	Benzene	ND	5	3.7	74	53-138
108-86-1	Bromobenzene	ND	5	3.7	74	54-138
74-97-5	Bromochloromethane	ND	5	4.2	84	55-140
75-27-4	Bromodichloromethane	ND	5	4.0	80	57-147
75-25-2	Bromoform	ND	5	4.4	88	47-137
74-83-9	Bromomethane	ND	2	2.1	105	40-162
104-51-8	n-Butylbenzene	ND	5	3.4	68	45-144
135-98-8	sec-Butylbenzene	ND	5	3.5	70	46-145
98-06-6	tert-Butylbenzene	ND	5	3.3	66	48-141
75-15-0	Carbon disulfide	ND	5	3.9	78	35-127
108-90-7	Chlorobenzene	ND	5	3.7	74	54-135
75-00-3	Chloroethane	ND	2	2.1	105	38-153
67-66-3	Chloroform	ND	5	3.9	78	57-151
74-87-3	Chloromethane	ND	2	2.1	105	39-165
95-49-8	o-Chlorotoluene	ND	5	3.6	72	55-142
106-43-4	p-Chlorotoluene	ND	5	3.5	70	55-139
56-23-5	Carbon tetrachloride	ND	5	4.1	82	49-170
75-34-3	1,1-Dichloroethane	ND	5	3.9	78	55-149
75-35-4	1,1-Dichloroethylene	ND	5	4.0	80	42-142
563-58-6	1,1-Dichloropropene	ND	5	3.7	74	46-151
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	4.0	80	48-141
106-93-4	1,2-Dibromoethane	ND	5	3.9	78	57-135
107-06-2	1,2-Dichloroethane	ND	5	4.0	80	59-166
78-87-5	1,2-Dichloropropane	ND	5	3.8	76	53-142
142-28-9	1,3-Dichloropropane	ND	5	4.0	80	58-143
594-20-7	2,2-Dichloropropane	ND	5	3.7	74	38-165
124-48-1	Dibromochloromethane	ND	5	4.3	86	55-138
74-95-3	Dibromomethane	ND	5	4.1	82	61-144
75-71-8	Dichlorodifluoromethane	ND	2	2.3	115	23-172
541-73-1	m-Dichlorobenzene	ND	5	3.8	76	53-138
95-50-1	o-Dichlorobenzene	ND	5	3.8	76	54-140
106-46-7	p-Dichlorobenzene	ND	5	3.7	74	53-137
156-60-5	trans-1,2-Dichloroethylene	ND	5	3.6	72	47-148
156-59-2	cis-1,2-Dichloroethylene	ND	5	3.7	74	51-146

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53728-1MS	1B112341.D	1	10/30/17	BK	n/a	n/a	V1B5364
JC53728-1	1B112334.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	JC53728-1 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	3.5	70	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	3.8	76	54-142
100-41-4	Ethylbenzene	ND	5	3.5	70	51-138
87-68-3	Hexachlorobutadiene	ND	5	3.9	78	40-154
591-78-6	2-Hexanone	ND	20	14.5	73	53-128
98-82-8	Isopropylbenzene	ND	5	3.3	66	49-139
99-87-6	p-Isopropyltoluene	ND	5	3.4	68	45-141
75-09-2	Methylene chloride	ND	5	4.0	80	54-137
1634-04-4	Methyl Tert Butyl Ether	ND	5	3.6	72	53-143
108-10-1	4-Methyl-2-pentanone	ND	20	15.0	75	58-127
91-20-3	Naphthalene	ND	5	3.4	68	44-140
103-65-1	n-Propylbenzene	ND	5	3.5	70	50-142
100-42-5	Styrene	ND	5	3.4	68	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	4.0	80	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	3.9	78	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	4.1	82	58-138
79-00-5	1,1,2-Trichloroethane	ND	5	4.0	80	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	3.8	76	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	4.2	84	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	3.6	72	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	3.4	68	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	3.5	70	45-138
127-18-4	Tetrachloroethylene	ND	5	3.9	78	45-145
108-88-3	Toluene	ND	5	3.5	70	52-134
79-01-6	Trichloroethylene	ND	5	3.8	76	54-143
75-69-4	Trichlorofluoromethane	ND	2	2.1	105	36-167
75-01-4	Vinyl chloride	ND	2	2.2	110	35-162
	m,p-Xylene	ND	10	7.0	70	49-135
95-47-6	o-Xylene	ND	5	3.4	68	49-134
1330-20-7	Xylenes (total)	ND	15	10.4	69	50-134

CAS No.	Surrogate Recoveries	MS	JC53728-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	105%	102%	70-130%
460-00-4	4-Bromofluorobenzene	95%	92%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53531-1MS	3A157896.D	1	10/23/17	PR	n/a	n/a	V3A6796
JC53531-1MSD	3A157897.D	1	10/23/17	PR	n/a	n/a	V3A6796
JC53531-1	3A157889.D	1	10/23/17	PR	n/a	n/a	V3A6796

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC53497-1, JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	JC53531-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	14.1	20	35.2	106	20	36.1	110	3	36-166/26	

CAS No.	Surrogate Recoveries	MS	MSD	JC53531-1	Limits
17647-74-4	1,4-Dioxane-d8	117%	116%	120%	51-175%

* = Outside of Control Limits.

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Duplicate Summary

Page 1 of 3

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53497-3DUP	1B112275.D	1	10/25/17	BK	n/a	n/a	V1B5358
JC53497-3	1B112231.D	1	10/24/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	JC53497-3		Q	RPD	Limits
		ug/l	DUP ug/l			
67-64-1	Acetone	ND	ND	nc	10	
78-93-3	2-Butanone	ND	ND	nc	12	
71-43-2	Benzene	ND	ND	nc	10	
108-86-1	Bromobenzene	ND	ND	nc	10	
74-97-5	Bromochloromethane	ND	ND	nc	10	
75-27-4	Bromodichloromethane	ND	ND	nc	10	
75-25-2	Bromoform	ND	ND	nc	10	
74-83-9	Bromomethane	ND	ND	nc	10	
104-51-8	n-Butylbenzene	ND	ND	nc	10	
135-98-8	sec-Butylbenzene	ND	ND	nc	10	
98-06-6	tert-Butylbenzene	ND	ND	nc	10	
75-15-0	Carbon disulfide	ND	ND	nc	19	
108-90-7	Chlorobenzene	ND	ND	nc	10	
75-00-3	Chloroethane	ND	ND	nc	10	
67-66-3	Chloroform	ND	ND	nc	12	
74-87-3	Chloromethane	ND	ND	nc	10	
95-49-8	o-Chlorotoluene	ND	ND	nc	10	
106-43-4	p-Chlorotoluene	ND	ND	nc	10	
56-23-5	Carbon tetrachloride	ND	ND	nc	10	
75-34-3	1,1-Dichloroethane	ND	ND	nc	10	
75-35-4	1,1-Dichloroethylene	ND	ND	nc	10	
563-58-6	1,1-Dichloropropene	ND	ND	nc	10	
96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	nc	10	
106-93-4	1,2-Dibromoethane	ND	ND	nc	10	
107-06-2	1,2-Dichloroethane	0.49	J 0.40	J	20* a	10
78-87-5	1,2-Dichloropropane	ND	ND	nc	10	
142-28-9	1,3-Dichloropropane	ND	ND	nc	10	
594-20-7	2,2-Dichloropropane	ND	ND	nc	10	
124-48-1	Dibromochloromethane	ND	ND	nc	10	
74-95-3	Dibromomethane	ND	ND	nc	10	
75-71-8	Dichlorodifluoromethane	ND	ND	nc	10	
541-73-1	m-Dichlorobenzene	ND	ND	nc	10	
95-50-1	o-Dichlorobenzene	ND	ND	nc	10	
106-46-7	p-Dichlorobenzene	ND	ND	nc	10	
156-60-5	trans-1,2-Dichloroethylene	ND	ND	nc	10	
156-59-2	cis-1,2-Dichloroethylene	ND	ND	nc	10	

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53497-3DUP	1B112275.D	1	10/25/17	BK	n/a	n/a	V1B5358
JC53497-3	1B112231.D	1	10/24/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

CAS No.	Compound	JC53497-3		DUP	RPD	Limits
		ug/l	Q	ug/l		
10061-01-5	cis-1,3-Dichloropropene	ND		ND	nc	10
10061-02-6	trans-1,3-Dichloropropene	ND		ND	nc	10
100-41-4	Ethylbenzene	ND		ND	nc	10
87-68-3	Hexachlorobutadiene	ND		ND	nc	10
591-78-6	2-Hexanone	ND		ND	nc	10
98-82-8	Isopropylbenzene	ND		ND	nc	10
99-87-6	p-Isopropyltoluene	ND		ND	nc	10
75-09-2	Methylene chloride	ND		ND	nc	10
1634-04-4	Methyl Tert Butyl Ether	2.3		1.7	30* a	10
108-10-1	4-Methyl-2-pentanone	ND		ND	nc	10
91-20-3	Naphthalene	ND		ND	nc	10
103-65-1	n-Propylbenzene	ND		ND	nc	10
100-42-5	Styrene	ND		ND	nc	10
630-20-6	1,1,1,2-Tetrachloroethane	ND		ND	nc	10
71-55-6	1,1,1-Trichloroethane	ND		ND	nc	10
79-34-5	1,1,2,2-Tetrachloroethane	ND		ND	nc	10
79-00-5	1,1,2-Trichloroethane	ND		ND	nc	10
87-61-6	1,2,3-Trichlorobenzene	ND		ND	nc	10
96-18-4	1,2,3-Trichloropropane	ND		ND	nc	10
120-82-1	1,2,4-Trichlorobenzene	ND		ND	nc	10
95-63-6	1,2,4-Trimethylbenzene	ND		ND	nc	10
108-67-8	1,3,5-Trimethylbenzene	ND		ND	nc	10
127-18-4	Tetrachloroethylene	ND		ND	nc	10
108-88-3	Toluene	ND		ND	nc	10
79-01-6	Trichloroethylene	ND		ND	nc	10
75-69-4	Trichlorofluoromethane	ND		ND	nc	10
75-01-4	Vinyl chloride	ND		ND	nc	10
	m,p-Xylene	ND		ND	nc	10
95-47-6	o-Xylene	ND		ND	nc	10
1330-20-7	Xylenes (total)	ND		ND	nc	10

CAS No.	Surrogate Recoveries	DUP	JC53497-3	Limits
2199-69-1	1,2-Dichlorobenzene-d4	101%	92%	70-130%
460-00-4	4-Bromofluorobenzene	99%	76%	70-130%

* = Outside of Control Limits.

Duplicate Summary

Page 3 of 3

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53497-3DUP	1B112275.D	1	10/25/17	BK	n/a	n/a	V1B5358
JC53497-3	1B112231.D	1	10/24/17	BK	n/a	n/a	V1B5358

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-2, JC53497-3, JC53497-4

(a) Outside in house control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53733-1DUP	1B112342.D	1	10/30/17	BK	n/a	n/a	V1B5364
JC53733-1	1B112337.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

5.6.2
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JC53497-1

CAS No.	Compound	JC53733-1		Q	RPD	Limits
		ug/l	DUP ug/l			
67-64-1	Acetone	ND	ND	nc	10	
78-93-3	2-Butanone	ND	ND	nc	12	
71-43-2	Benzene	ND	ND	nc	10	
108-86-1	Bromobenzene	ND	ND	nc	10	
74-97-5	Bromochloromethane	ND	ND	nc	10	
75-27-4	Bromodichloromethane	ND	ND	nc	10	
75-25-2	Bromoform	ND	ND	nc	10	
74-83-9	Bromomethane	ND	ND	nc	10	
104-51-8	n-Butylbenzene	ND	ND	nc	10	
135-98-8	sec-Butylbenzene	ND	ND	nc	10	
98-06-6	tert-Butylbenzene	ND	ND	nc	10	
75-15-0	Carbon disulfide	ND	ND	nc	19	
108-90-7	Chlorobenzene	ND	ND	nc	10	
75-00-3	Chloroethane	ND	ND	nc	10	
67-66-3	Chloroform	ND	ND	nc	12	
74-87-3	Chloromethane	ND	ND	nc	10	
95-49-8	o-Chlorotoluene	ND	ND	nc	10	
106-43-4	p-Chlorotoluene	ND	ND	nc	10	
56-23-5	Carbon tetrachloride	ND	ND	nc	10	
75-34-3	1,1-Dichloroethane	ND	ND	nc	10	
75-35-4	1,1-Dichloroethylene	ND	ND	nc	10	
563-58-6	1,1-Dichloropropene	ND	ND	nc	10	
96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	nc	10	
106-93-4	1,2-Dibromoethane	ND	ND	nc	10	
107-06-2	1,2-Dichloroethane	ND	ND	nc	10	
78-87-5	1,2-Dichloropropane	ND	ND	nc	10	
142-28-9	1,3-Dichloropropane	ND	ND	nc	10	
594-20-7	2,2-Dichloropropane	ND	ND	nc	10	
124-48-1	Dibromochloromethane	ND	ND	nc	10	
74-95-3	Dibromomethane	ND	ND	nc	10	
75-71-8	Dichlorodifluoromethane	ND	ND	nc	10	
541-73-1	m-Dichlorobenzene	ND	ND	nc	10	
95-50-1	o-Dichlorobenzene	ND	ND	nc	10	
106-46-7	p-Dichlorobenzene	ND	ND	nc	10	
156-60-5	trans-1,2-Dichloroethylene	ND	ND	nc	10	
156-59-2	cis-1,2-Dichloroethylene	ND	ND	nc	10	

* = Outside of Control Limits.

Duplicate Summary

Page 2 of 2

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53733-1DUP	1B112342.D	1	10/30/17	BK	n/a	n/a	V1B5364
JC53733-1	1B112337.D	1	10/30/17	BK	n/a	n/a	V1B5364

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC53497-1

CAS No.	Compound	JC53733-1 ug/l	DUP Q	ND	RPD	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10	
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10	
100-41-4	Ethylbenzene	ND	ND	nc	10	
87-68-3	Hexachlorobutadiene	ND	ND	nc	10	
591-78-6	2-Hexanone	ND	ND	nc	10	
98-82-8	Isopropylbenzene	ND	ND	nc	10	
99-87-6	p-Isopropyltoluene	ND	ND	nc	10	
75-09-2	Methylene chloride	ND	ND	nc	10	
1634-04-4	Methyl Tert Butyl Ether	ND	ND	nc	10	
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10	
91-20-3	Naphthalene	ND	ND	nc	10	
103-65-1	n-Propylbenzene	ND	ND	nc	10	
100-42-5	Styrene	ND	ND	nc	10	
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10	
71-55-6	1,1,1-Trichloroethane	ND	ND	nc	10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10	
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10	
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10	
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10	
127-18-4	Tetrachloroethylene	ND	ND	nc	10	
108-88-3	Toluene	ND	ND	nc	10	
79-01-6	Trichloroethylene	ND	ND	nc	10	
75-69-4	Trichlorofluoromethane	ND	ND	nc	10	
75-01-4	Vinyl chloride	ND	ND	nc	10	
	m,p-Xylene	ND	ND	nc	10	
95-47-6	o-Xylene	ND	ND	nc	10	
1330-20-7	Xylenes (total)	ND	ND	nc	10	

CAS No.	Surrogate Recoveries	DUP	JC53733-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	100%	99%	70-130%
460-00-4	4-Bromofluorobenzene	90%	90%	70-130%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5344-BFB	Injection Date:	10/10/17
Lab File ID:	1B112059.D	Injection Time:	11:22
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3464	18.7	Pass
75	30.0 - 80.0% of mass 95	9366	50.7	Pass
95	Base peak, 100% relative abundance	18475	100.0	Pass
96	5.0 - 9.0% of mass 95	1152	6.24	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	16619	90.0	Pass
175	5.0 - 9.0% of mass 174	1199	6.49	(7.21) ^a Pass
176	95.0 - 101.0% of mass 174	16106	87.2	(96.9) ^a Pass
177	5.0 - 9.0% of mass 176	1041	5.63	(6.46) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5344-IC5344	1B112060.D	10/10/17	11:55	00:33	Initial cal 0.2
V1B5344-IC5344	1B112063.D	10/10/17	13:32	02:10	Initial cal 2
V1B5344-IC5344	1B112064.D	10/10/17	14:03	02:41	Initial cal 5
V1B5344-ICC5344	1B112065.D	10/10/17	14:34	03:12	Initial cal 10
V1B5344-IC5344	1B112066.D	10/10/17	15:06	03:44	Initial cal 20
V1B5344-IC5344	1B112067.D	10/10/17	15:38	04:16	Initial cal 40
V1B5344-IC5344	1B112068.D	10/10/17	16:10	04:48	Initial cal 80
V1B5344-IC5344	1B112071.D	10/10/17	17:45	06:23	Initial cal 0.5
V1B5344-IC5344	1B112072.D	10/10/17	18:17	06:55	Initial cal 1
V1B5344-ICV5344	1B112073.D	10/10/17	20:30	09:08	Initial cal verification 10
V1B5345-MB	1B112074.D	10/10/17	21:02	09:40	Method Blank
V1B5345-BS	1B112075.D	10/10/17	21:34	10:12	Blank Spike
ZZZZZZ	1B112076.D	10/10/17	22:06	10:44	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: JC53497

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5358-BFB	Injection Date:	10/23/17
Lab File ID:	1B112226.D	Injection Time:	20:21
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	1622	20.1	Pass
75	30.0 - 80.0% of mass 95	4060	50.3	Pass
95	Base peak, 100% relative abundance	8072	100.0	Pass
96	5.0 - 9.0% of mass 95	553	6.85	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	7574	93.8	Pass
175	5.0 - 9.0% of mass 174	550	6.81	(7.26) ^a Pass
176	95.0 - 101.0% of mass 174	7214	89.4	(95.2) ^a Pass
177	5.0 - 9.0% of mass 176	510	6.32	(7.07) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5358-CC5344	1B112227.D	10/23/17	21:39	01:18	Continuing cal 5
V1B5358-MB	1B112228.D	10/23/17	22:48	02:27	Method Blank
V1B5358-BS	1B112229.D	10/23/17	23:20	02:59	Blank Spike
JC53497-2	1B112230.D	10/24/17	00:26	04:05	RW_7742TO-101817
JC53497-3	1B112231.D	10/24/17	00:58	04:37	RW_907REE-101817
JC53497-4	1B112232.D	10/24/17	01:30	05:09	RW_907REE-101817-F
ZZZZZZ	1B112234.D	10/24/17	02:33	06:12	(unrelated sample)
JC53497-2MS	1B112235.D	10/24/17	08:16	11:55	Matrix Spike

Instrument Performance Check (BFB)

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5360-BFB	Injection Date:	10/25/17
Lab File ID:	1B112259.D	Injection Time:	10:25
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3297	17.0	Pass
75	30.0 - 80.0% of mass 95	8927	46.1	Pass
95	Base peak, 100% relative abundance	19357	100.0	Pass
96	5.0 - 9.0% of mass 95	1347	6.96	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	15475	79.9	Pass
175	5.0 - 9.0% of mass 174	1091	5.64	(7.05) ^a Pass
176	95.0 - 101.0% of mass 174	14990	77.4	(96.9) ^a Pass
177	5.0 - 9.0% of mass 176	1032	5.33	(6.88) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5360-IC5360	1B112260.D	10/25/17	11:06	00:41	Initial cal 0.2
V1B5360-IC5360	1B112261.D	10/25/17	11:38	01:13	Initial cal 0.5
V1B5360-IC5360	1B112262.D	10/25/17	12:10	01:45	Initial cal 1
V1B5360-IC5360	1B112263.D	10/25/17	12:41	02:16	Initial cal 2
V1B5360-IC5360	1B112264.D	10/25/17	13:13	02:48	Initial cal 5
V1B5360-ICC5360	1B112265.D	10/25/17	13:45	03:20	Initial cal 10
V1B5360-IC5360	1B112266.D	10/25/17	14:17	03:52	Initial cal 20
V1B5360-IC5360	1B112267.D	10/25/17	14:49	04:24	Initial cal 40
V1B5360-IC5360	1B112268.D	10/25/17	15:20	04:55	Initial cal 80
V1B5360-ICV5360	1B112270.D	10/25/17	16:30	06:05	Initial cal verification 10
V1B5360-ICV5360	1B112271.D	10/25/17	17:07	06:42	Initial cal verification 10
V1B5358-MB2	1B112273.D	10/25/17	18:10	07:45	Method Blank
V1B5358-BS2	1B112274.D	10/25/17	18:41	08:16	Blank Spike
JC53497-3DUP	1B112275.D	10/25/17	19:27	09:02	Duplicate

Instrument Performance Check (BFB)

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5364-BFB	Injection Date:	10/30/17
Lab File ID:	1B112327.D	Injection Time:	09:27
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3268	17.5	Pass
75	30.0 - 80.0% of mass 95	8842	47.4	Pass
95	Base peak, 100% relative abundance	18644	100.0	Pass
96	5.0 - 9.0% of mass 95	1341	7.19	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	16838	90.3	Pass
175	5.0 - 9.0% of mass 174	1271	6.82	(7.55) ^a Pass
176	95.0 - 101.0% of mass 174	16092	86.3	(95.6) ^a Pass
177	5.0 - 9.0% of mass 176	1008	5.41	(6.26) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5364-CC5360	1B112328.D	10/30/17	10:03	00:36	Continuing cal 5
V1B5364-MB	1B112329.D	10/30/17	10:39	01:12	Method Blank
V1B5364-BS	1B112330.D	10/30/17	11:10	01:43	Blank Spike
V1B5364-BSD	1B112331.D	10/30/17	11:43	02:16	Blank Spike Duplicate
ZZZZZZ	1B112332.D	10/30/17	12:24	02:57	(unrelated sample)
JC53497-1	1B112333.D	10/30/17	12:56	03:29	TB_161817
JC53728-1	1B112334.D	10/30/17	13:27	04:00	(used for QC only; not part of job JC53497)
ZZZZZZ	1B112335.D	10/30/17	13:59	04:32	(unrelated sample)
ZZZZZZ	1B112336.D	10/30/17	14:30	05:03	(unrelated sample)
JC53733-1	1B112337.D	10/30/17	15:02	05:35	(used for QC only; not part of job JC53497)
ZZZZZZ	1B112338.D	10/30/17	15:34	06:07	(unrelated sample)
ZZZZZZ	1B112339.D	10/30/17	16:05	06:38	(unrelated sample)
ZZZZZZ	1B112340.D	10/30/17	16:36	07:09	(unrelated sample)
JC53728-1MS	1B112341.D	10/30/17	17:08	07:41	Matrix Spike
JC53733-1DUP	1B112342.D	10/30/17	17:39	08:12	Duplicate
ZZZZZZ	1B112343.D	10/30/17	18:11	08:44	(unrelated sample)
ZZZZZZ	1B112344.D	10/30/17	18:43	09:16	(unrelated sample)
ZZZZZZ	1B112345.D	10/30/17	19:15	09:48	(unrelated sample)
ZZZZZZ	1B112346.D	10/30/17	19:47	10:20	(unrelated sample)
ZZZZZZ	1B112347.D	10/30/17	20:18	10:51	(unrelated sample)
ZZZZZZ	1B112348.D	10/30/17	20:50	11:23	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6787-BFB	Injection Date:	09/27/17
Lab File ID:	3A157637.D	Injection Time:	09:47
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	8122	18.0	Pass
75	30.0 - 60.0% of mass 95	22219	49.3	Pass
95	Base peak, 100% relative abundance	45101	100.0	Pass
96	5.0 - 9.0% of mass 95	2935	6.51	Pass
173	Less than 2.0% of mass 174	240	0.53	(0.74) ^a Pass
174	50.0 - 120.0% of mass 95	32469	72.0	Pass
175	5.0 - 9.0% of mass 174	2483	5.51	(7.65) ^a Pass
176	95.0 - 101.0% of mass 174	30872	68.5	(95.1) ^a Pass
177	5.0 - 9.0% of mass 176	2102	4.66	(6.81) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6787-IC6787	3A157638.D	09/27/17	10:21	00:34	Initial cal 0.25
V3A6787-IC6787	3A157639.D	09/27/17	10:47	01:00	Initial cal 0.4
V3A6787-IC6787	3A157640.D	09/27/17	11:13	01:26	Initial cal 1
V3A6787-IC6787	3A157641.D	09/27/17	11:39	01:52	Initial cal 2
V3A6787-IC6787	3A157642.D	09/27/17	12:06	02:19	Initial cal 5
V3A6787-ICC6787	3A157643.D	09/27/17	12:32	02:45	Initial cal 20
V3A6787-IC6787	3A157644.D	09/27/17	12:58	03:11	Initial cal 50
V3A6787-IC6787	3A157645.D	09/27/17	13:24	03:37	Initial cal 100
V3A6787-IC6787	3A157646.D	09/27/17	13:49	04:02	Initial cal 200
V3A6787-ICV6787	3A157649.D	09/27/17	15:08	05:21	Initial cal verification 20
V3A6785-MB2	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6788-MB	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6785-BS2	3A157652.D	09/27/17	16:26	06:39	Blank Spike
V3A6788-BS	3A157652.D	09/27/17	16:26	06:39	Blank Spike
JC51376-1DUP	3A157654.D	09/27/17	17:18	07:31	Duplicate
ZZZZZZ	3A157655.D	09/27/17	17:43	07:56	(unrelated sample)
JC51376-4MS	3A157656.D	09/27/17	18:09	08:22	Matrix Spike
JC51468-2	3A157658.D	09/27/17	19:02	09:15	(used for QC only; not part of job JC53497)
ZZZZZZ	3A157659.D	09/27/17	19:28	09:41	(unrelated sample)
JC51468-5	3A157660.D	09/27/17	19:54	10:07	(used for QC only; not part of job JC53497)
JC51468-5DUP	3A157661.D	09/27/17	20:27	10:40	Duplicate
JC51468-2MS	3A157662.D	09/27/17	20:54	11:07	Matrix Spike

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6796-BFB	Injection Date:	10/23/17
Lab File ID:	3A157878.D	Injection Time:	09:58
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	6790	16.4	Pass
75	30.0 - 60.0% of mass 95	19784	47.9	Pass
95	Base peak, 100% relative abundance	41277	100.0	Pass
96	5.0 - 9.0% of mass 95	2943	7.13	Pass
173	Less than 2.0% of mass 174	282	0.68	(0.91) ^a Pass
174	50.0 - 120.0% of mass 95	31058	75.2	Pass
175	5.0 - 9.0% of mass 174	2382	5.77	(7.67) ^a Pass
176	95.0 - 101.0% of mass 174	30477	73.8	(98.1) ^a Pass
177	5.0 - 9.0% of mass 176	2093	5.07	(6.87) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6796-CC6787	3A157879.D	10/23/17	10:37	00:39	Continuing cal 5
V3A6796-MB	3A157880.D	10/23/17	11:07	01:09	Method Blank
V3A6796-BS	3A157881.D	10/23/17	11:35	01:37	Blank Spike
JC53497-1	3A157883.D	10/23/17	12:27	02:29	TB_161817
JC53497-2	3A157884.D	10/23/17	12:53	02:55	RW_7742TO-101817
JC53497-3	3A157885.D	10/23/17	13:18	03:20	RW_907REE-101817
JC53497-4	3A157886.D	10/23/17	13:44	03:46	RW-907REE-101817-F
ZZZZZZ	3A157887.D	10/23/17	14:10	04:12	(unrelated sample)
ZZZZZZ	3A157888.D	10/23/17	14:36	04:38	(unrelated sample)
JC53531-1	3A157889.D	10/23/17	15:02	05:04	(used for QC only; not part of job JC53497)
ZZZZZZ	3A157890.D	10/23/17	15:28	05:30	(unrelated sample)
ZZZZZZ	3A157891.D	10/23/17	15:54	05:56	(unrelated sample)
ZZZZZZ	3A157892.D	10/23/17	16:20	06:22	(unrelated sample)
ZZZZZZ	3A157893.D	10/23/17	16:46	06:48	(unrelated sample)
ZZZZZZ	3A157894.D	10/23/17	17:12	07:14	(unrelated sample)
ZZZZZZ	3A157895.D	10/23/17	17:38	07:40	(unrelated sample)
JC53531-1MS	3A157896.D	10/23/17	18:04	08:06	Matrix Spike
JC53531-1MSD	3A157897.D	10/23/17	18:30	08:32	Matrix Spike Duplicate

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC53497

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC53497-1	1B112333.D	101	92
JC53497-2	1B112230.D	95	78
JC53497-3	1B112231.D	92	76
JC53497-4	1B112232.D	92	76
JC53497-2MS	1B112235.D	108	89
JC53497-3DUP	1B112275.D	101	99
JC53728-1MS	1B112341.D	105	95
JC53733-1DUP	1B112342.D	100	90
V1B5358-BS	1B112229.D	107	87
V1B5358-MB	1B112228.D	94	78
V1B5364-BS	1B112330.D	105	97
V1B5364-BSD	1B112331.D	105	97
V1B5364-MB	1B112329.D	101	94
V1B5358-MB2	1B112273.D	98	98

Surrogate Compounds	Recovery Limits
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S1 = 1,2-Dichlorobenzene-d4	70-130%
S2 = 4-Bromofluorobenzene	70-130%

5.8.1
5

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC53497

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC53497-1	3A157883.D	108
JC53497-2	3A157884.D	109
JC53497-3	3A157885.D	107
JC53497-4	3A157886.D	113
JC53531-1MS	3A157896.D	117
JC53531-1MSD	3A157897.D	116
V3A6796-BS	3A157881.D	102
V3A6796-MB	3A157880.D	103

Surrogate
Compounds

Recovery
Limits

S1 = 1,4-Dioxane-d8

51-175%

5.8.2
5

Sample Summary

WSP Environment & Energy

Job No: JC54686

Kop-Flex, Hanover, VA
Project No: 31400389/03

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC54686-1	11/02/17	09:50 CC/SB	11/03/17 AQ	Water	RW-919RD110217-F
JC54686-2	11/02/17	10:05 CC/SB	11/03/17 AQ	Water	RW-919RD110217
JC54686-3	11/02/17	10:05 CC/SB	11/03/17 AQ	Trip Blank Water	TRIP BLANK

Report of Analysis

Page 1 of 3

Client Sample ID:	RW-919RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-1	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	1B112560.D	1	11/10/17 15:24	BK	n/a	n/a	V1B5375

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	RW-919RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-1	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.14	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	96%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID:	RW-919RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-1	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	RW-919RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-1	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158049.D	1	11/08/17 17:53	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	102%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 3

Client Sample ID:	RW-919RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	1B112561.D	1	11/10/17 15:55	BK	n/a	n/a	V1B5375

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	RW-919RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.12	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	97%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID:	RW-919RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	RW-919RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158050.D	1	11/08/17 18:19	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
Surrogate Recoveries						
17647-74-4	1,4-Dioxane-d8	103%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-3	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1B112562.D	1	11/10/17 16:28	BK	n/a	n/a	V1B5375

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-3	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	97%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-3	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54686-3	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158068.D	1	11/10/17 16:34	BM	n/a	n/a	V3A6803
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	88%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

WW, WTB

CHAIN-OF-CUSTODY RECORD

JC 54686

Page 1 of 1

WSP USA Office Address 13530 Dulles Technology Dr, Suite 300, Herndon, VA 20171				Requested Analyses & Preservatives				No. 008177	WSP	
Project Name Kop-Flex		WSP USA Contact Name Eric Johnson						Laboratory Name & Location SGS Accutest		
Project Location Hanover, MD		WSP USA Contact E-mail Eric.Johnson @wsp.com						Laboratory Project Manager Rocus Peters		
Project Number & Task 31400389/03		WSP USA Contact Phone 703-709-6500		Number of Containers					Requested Turn-Around-Time <input type="checkbox"/> Standard <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> _____ HR <input checked="" type="checkbox"/> S day	
Sampler(s) Name(s) Chris Cresci Shannan Burke		Sampler(s) Signature(s) Chris Cresci Shannan Burke								
Sample Identification 1 RW-919 RD110217-F	Matrix AQ	Collection Start* Date 11/2/17	Time 0950	6	VOCs EPA 524 1,4 Dioxane (8260 STP)	X	X			Sample Comments
2 RW-919 RD110217- XXXX	AQ	11/2/17	1005	6	X	X				V120
3 Trip blank	TB			2	X					
Trip blank	TB			2	X					
Relinquished By (Signature) 	Date 11/3	Time 9:20	Received By (Signature) 	Date 11/3/17	Time 9:20	Shipment Method fx	Tracking Number(s) 788511611920			
Relinquished By (Signature) 	Date 11/3	Time 9:20	Received By (Signature) 	Date 11/3/17	Time 9:20	Number of Packages	Custody Seal Number(s)			

*Use stop time/date for composite and/or air samples; use only start time/date for all other samples.

Matrix: AQ = Aqueous, S = Soil, SE = Sediment, A = Air, W = Wipe, B = Bulk, O = Other (detail in comments)

ZAH

JC54686: Chain of Custody

Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: JC54686 Client: _____ Project: _____
 Date / Time Received: 11/3/2017 9:20:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (0.5);

Cooler Security	<u>Y or N</u>	<u>Y or N</u>	Sample Integrity - Documentation	<u>Y or N</u>		
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
Cooler Temperature		<u>Y or N</u>	Sample Integrity - Condition			
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact		
4. No. Coolers:	1					
Quality Control Preservation		<u>Y or N</u>	<u>N/A</u>	Sample Integrity - Instructions	<u>Y or N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
			5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Comments

SM089-02
 Rev. Date 12/1/16

JC54686: Chain of Custody

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New Jersey

11/20/17

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e-Hardcopy 2.0
Automated Report

Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

31400389/03

SGS Accutest Job Number: JC54694

Sampling Date: 11/02/17



Report to:

**WSP
11190 Sunrise Valley Drive Suite 300
Reston, VA 20190
eric.johnson@wspgroup.com**

ATTN: Eric Johnson

Total number of pages in report: 62



Test results contained within this data package meet the requirements
of the National Environmental Laboratory Accreditation Program
and/or state specific certification programs as applicable.

**Nancy Cole
Laboratory Director**

Client Service contact: Rocus Peters 732-329-0200

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Sample Summary

WSP Environment & Energy

Job No: JC54694

Kop-Flex, Hanover, VA
Project No: 31400389/03

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC54694-1	11/02/17	10:40 CC/SB	11/03/17	AQ Water	RW-1307RD110217
JC54694-2	11/02/17	11:25 CC/SB	11/03/17	AQ Water	RW-1230PCC110217-F
JC54694-3	11/02/17	11:35 CC/SB	11/03/17	AQ Water	RW-1230PCC110217
JC54694-4	11/02/17	13:00 CC/SB	11/03/17	AQ Water	RW-901RD110217
JC54694-5	11/02/17	13:05 CC/SB	11/03/17	AQ Water	RW-901RD110217-F
JC54694-6	11/02/17	13:40 CC/SB	11/03/17	AQ Water	RW-921RD110217
JC54694-7	11/02/17	14:20 CC/SB	11/03/17	AQ Water	RW-1213SSR110217
JC54694-8	11/02/17	14:20 CC/SB	11/03/17	AQ Trip Blank Water	TRIP BLANK

Summary of Hits

Job Number: JC54694
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 11/02/17

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

JC54694-1 RW-1307RD110217

Chloroform ^a 0.35 J 0.50 0.33 ug/l EPA 524.2 REV 4.1

JC54694-2 RW-1230PCC110217-F

No hits reported in this sample.

JC54694-3 RW-1230PCC110217

Methyl Tert Butyl Ether ^a 0.11 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

JC54694-4 RW-901RD110217

Methyl Tert Butyl Ether ^a	0.25 J	0.50	0.080	ug/l	EPA 524.2 REV 4.1
1,4-Dioxane	0.44	0.40	0.29	ug/l	SW846 8260C BY SIM

JC54694-5 RW-901RD110217-F

1,4-Dioxane 0.42 0.40 0.29 ug/l SW846 8260C BY SIM

JC54694-6 RW-921RD110217

No hits reported in this sample.

JC54694-7 RW-1213SSR110217

Methyl Tert Butyl Ether ^a 0.37 J 0.50 0.080 ug/l EPA 524.2 REV 4.1

JC54694-8 TRIP BLANK

No hits reported in this sample.

(a) EPA 524.2 is not a certified method for non-potable water samples.



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New Jersey

Section 3

3

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 3

3

Client Sample ID: RW-1307RD110217
 Lab Sample ID: JC54694-1
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112631.D	1	11/14/17 04:20	BK	n/a	n/a	V1B5378

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	0.35	0.50	0.33	ug/l	J
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

3-1

3

Client Sample ID: RW-1307RD110217
 Lab Sample ID: JC54694-1
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	88%		70-130%
460-00-4	4-Bromofluorobenzene	79%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

3.1

3

Client Sample ID:	RW-1307RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-1	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

3

Client Sample ID: RW-1307RD110217
Lab Sample ID: JC54694-1
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
Date Received: 11/03/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158043.D	1	11/08/17 15:11	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	106%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-1230PCC110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1B112632.D	1	11/14/17 04:51	BK	n/a	n/a	V1B5378

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-1230PCC110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1230PCC110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1230PCC110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-2	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158046.D	1	11/08/17 16:32	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
Surrogate Recoveries						
17647-74-4	1,4-Dioxane-d8	90%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-1230PCC110217

Lab Sample ID: JC54694-3

Date Sampled: 11/02/17

Matrix: AQ - Water

Date Received: 11/03/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112633.D	1	11/14/17 05:23	BK	n/a	n/a	V1B5378

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-1230PCC110217
 Lab Sample ID: JC54694-3
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.11	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	89%		70-130%
460-00-4	4-Bromofluorobenzene	77%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1230PCC110217
Lab Sample ID: JC54694-3
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
Date Received: 11/03/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1230PCC110217
 Lab Sample ID: JC54694-3
 Matrix: AQ - Water
 Method: SW846 8260C BY SIM
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158051.D	1	11/08/17 18:46	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	112%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-901RD110217
 Lab Sample ID: JC54694-4
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112634.D	1	11/14/17 05:54	BK	n/a	n/a	V1B5378

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-901RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-4	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.25	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-901RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-4	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-901RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-4	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158052.D	1	11/08/17 19:13	BM	n/a	n/a	V3A6802
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	0.44	0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits						
17647-74-4	1,4-Dioxane-d8	103%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-901RD110217-F
 Lab Sample ID: JC54694-5
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112635.D	1	11/14/17 06:26	BK	n/a	n/a	V1B5378

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-901RD110217-F
 Lab Sample ID: JC54694-5
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	75%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-901RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-5	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-901RD110217-F	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-5	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A158053.D	DF 1	Analyzed 11/08/17 19:40	By BM	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6802
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	0.42	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	95%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-921RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-6	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		
Run #1 ^a	File ID 1B112636.D	DF 1	Analyzed 11/14/17 06:58 By BK Prep Date n/a Prep Batch n/a Analytical Batch V1B5378
Run #2			
	Purge Volume Run #1 5.0 ml Run #2		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID: RW-921RD110217
 Lab Sample ID: JC54694-6
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%		70-130%
460-00-4	4-Bromofluorobenzene	75%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-921RD110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-6	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

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Client Sample ID: RW-921RD110217
Lab Sample ID: JC54694-6
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
Date Received: 11/03/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158054.D	1	11/08/17 20:07	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	90%			51-175%	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-1213SSR110217	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-7	Date Received:	11/03/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		
Run #1 ^a	File ID 1B112637.D	DF 1	Analyzed 11/14/17 07:30 By BK Prep Date n/a Prep Batch n/a Analytical Batch V1B5378
Run #2			
	Purge Volume Run #1 5.0 ml Run #2		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-1213SSR110217
 Lab Sample ID: JC54694-7
 Matrix: AQ - Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
 Date Received: 11/03/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.37	0.50	0.080	ug/l	J
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	89%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1213SSR110217
Lab Sample ID: JC54694-7
Matrix: AQ - Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
Date Received: 11/03/17
Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1213SSR110217
Lab Sample ID: JC54694-7
Matrix: AQ - Water
Method: SW846 8260C BY SIM
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17
Date Received: 11/03/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158055.D	1	11/08/17 20:34	BM	n/a	n/a	V3A6802
Run #2							

Purge Volume
 Run #1 5.0 ml
 Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	92%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK
Lab Sample ID: JC54694-8
Matrix: AQ - Trip Blank Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 11/02/17

Date Received: 11/03/17

Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B112638.D	1	11/14/17 08:02	BK	n/a	n/a	V1B5378

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-8	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	88%		70-130%
460-00-4	4-Bromofluorobenzene	76%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-8	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TRIP BLANK	Date Sampled:	11/02/17
Lab Sample ID:	JC54694-8	Date Received:	11/03/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A158042.D	DF 1	Analyzed 11/08/17 14:33	By BM	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6802
Run #2							

Purge Volume Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	98%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms**Custody Documents and Other Forms**

Includes the following where applicable:

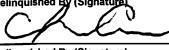
- Chain of Custody

WW
WTB

CHAIN-OF-CUSTODY RECORD

JC 54694

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WSP Parsons Brinckerhoff Office Address 13530 Dulles Technology Drive, Suite 300, Herndon, VA 20171				Requested Analyses & Preservatives				No. 004655  PARSONS BRINCKERHOFF	
Project Name KOP Flex	WSP Parsons Brinckerhoff Contact Name Eric Johnson							Laboratory Name & Location SGS Accutest	
Project Location Hanover, MD	WSP Parsons Brinckerhoff Contact E-mail Eric.Johnson@wspgroup.com							Laboratory Project Manager Rocus Peters	
Project Number & Task 31400389/03	WSP Parsons Brinckerhoff Contact Phone 703-709-6500			Number of Containers VOCs EPA 524 1,4 Dioxane (8260 STP)					Requested Turn-Around-Time <input checked="" type="checkbox"/> Standard 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> _____ HR
Sampler(s) Name(s) Chris Cresci Shannon Burke	Sampler(s) Signature(s)  								Sample Comments Missing "RW" on labels
Sample Identification 1 RW-1307 RD110217	Matrix AQ	Collection Start* Date 11/2/17	Collection Stop* Time 1040		6 X X				
2 RW-1230 PCC110217-F	AQ	11/2/17	1125		6 X X				
3 RW-1230 PCC110217	AQ	11/2/17	1135		6 X X				
4 RW-901 RD110217	AQ	11/2/17	1300		6 X X				
5 RW-901 RD110217-F	AQ	11/2/17	1305		6 X X				
6 RW-921 RD110217	AQ	11/2/17	1340		6 X X				
7 RW-1213 JSR110217	AQ	11/2/17	1420		6 X X				
8 Trip blank	TB			2 X					
Trip blank	TB			2 X					
Relinquished By (Signature) 	Date 11/3	Time 9:20	Received By (Signature) 	Date 11/3	Time 9:20	Shipment Method	Tracking Number(s) 809475368665		
Relinquished By (Signature) 	Date 11/3	Time 9:20	Received By (Signature) 	Date 11/3	Time 9:20	Number of Packages	Custody Seal Number(s) 71621		

*Use stop time/date for composite and/or air samples; use only start time/date for all other samples.

Matrix: AQ = Aqueous, S = Soil, SE = Sediment, A = Air, W = Wipe, B = Bulk, O = Other (detail in comments)

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JC54694: Chain of Custody

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SGS Accutest Sample Receipt Summary

Job Number: JC54694 Client: _____ Project: _____
 Date / Time Received: 11/3/2017 9:20:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (0.5);

Cooler Security	Y or N	Y or N	Sample Integrity - Documentation	Y or N
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>	1. Sample labels present on bottles:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>	2. Container labeling complete:	<input checked="" type="checkbox"/> <input type="checkbox"/>
			3. Sample container label / COC agree:	<input checked="" type="checkbox"/> <input type="checkbox"/>
Cooler Temperature		Y or N	Sample Integrity - Condition	
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact
4. No. Coolers:	1			
Quality Control Preservation		Y or N	Y or N	N/A
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
			5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

Comments

SM089-02
 Rev. Date 12/1/16

JC54694: Chain of Custody
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4.1

4

MS Volatiles**QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries

Method Blank Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-MB	1B112624.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

Page 2 of 3

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-MB	1B112624.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits
2199-69-1	1,2-Dichlorobenzene-d4	89% 70-130%
460-00-4	4-Bromofluorobenzene	79% 70-130%

Method Blank Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-MB	1B112624.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method:

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Method Blank Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6802-MB	3A158039.D	1	11/08/17	BM	n/a	n/a	V3A6802

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8	105% 51-175%

Blank Spike Summary

Page 1 of 3

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-BS	1B112625.D	1	11/14/17	BK n/a	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	23.5	118	70-130
78-93-3	2-Butanone	20	21.8	109	70-130
71-43-2	Benzene	5	5.9	118	70-130
108-86-1	Bromobenzene	5	5.4	108	70-130
74-97-5	Bromochloromethane	5	6.0	120	70-130
75-27-4	Bromodichloromethane	5	6.1	122	70-130
75-25-2	Bromoform	5	6.1	122	70-130
74-83-9	Bromomethane	2	2.1	105	70-130
104-51-8	n-Butylbenzene	5	4.6	92	70-130
135-98-8	sec-Butylbenzene	5	4.9	98	70-130
98-06-6	tert-Butylbenzene	5	4.7	94	70-130
75-15-0	Carbon disulfide	5	6.6	132* a	70-130
108-90-7	Chlorobenzene	5	5.5	110	70-130
75-00-3	Chloroethane	2	2.2	110	70-130
67-66-3	Chloroform	5	5.9	118	70-130
74-87-3	Chloromethane	2	2.0	100	70-130
95-49-8	o-Chlorotoluene	5	5.3	106	70-130
106-43-4	p-Chlorotoluene	5	5.2	104	70-130
56-23-5	Carbon tetrachloride	5	6.1	122	70-130
75-34-3	1,1-Dichloroethane	5	6.0	120	70-130
75-35-4	1,1-Dichloroethylene	5	6.1	122	70-130
563-58-6	1,1-Dichloropropene	5	5.3	106	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	5.8	116	70-130
106-93-4	1,2-Dibromoethane	5	5.5	110	70-130
107-06-2	1,2-Dichloroethane	5	6.0	120	70-130
78-87-5	1,2-Dichloropropane	5	5.8	116	70-130
142-28-9	1,3-Dichloropropane	5	5.9	118	70-130
594-20-7	2,2-Dichloropropane	5	4.9	98	70-130
124-48-1	Dibromochloromethane	5	5.9	118	70-130
74-95-3	Dibromomethane	5	6.2	124	70-130
75-71-8	Dichlorodifluoromethane	2	2.2	110	70-130
541-73-1	m-Dichlorobenzene	5	5.7	114	70-130
95-50-1	o-Dichlorobenzene	5	5.6	112	70-130
106-46-7	p-Dichlorobenzene	5	5.5	110	70-130
156-60-5	trans-1,2-Dichloroethylene	5	5.3	106	70-130
156-59-2	cis-1,2-Dichloroethylene	5	5.5	110	70-130

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-BS	1B112625.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	4.9	98	70-130
10061-02-6	trans-1,3-Dichloropropene	5	5.3	106	70-130
100-41-4	Ethylbenzene	5	5.3	106	70-130
87-68-3	Hexachlorobutadiene	5	5.4	108	70-130
591-78-6	2-Hexanone	20	20.7	104	70-130
98-82-8	Isopropylbenzene	5	4.6	92	70-130
99-87-6	p-Isopropyltoluene	5	4.8	96	70-130
75-09-2	Methylene chloride	5	6.0	120	70-130
1634-04-4	Methyl Tert Butyl Ether	5	4.9	98	70-130
108-10-1	4-Methyl-2-pentanone	20	22.1	111	70-130
91-20-3	Naphthalene	5	4.7	94	70-130
103-65-1	n-Propylbenzene	5	5.1	102	70-130
100-42-5	Styrene	5	5.0	100	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	6.0	120	70-130
71-55-6	1,1,1-Trichloroethane	5	5.9	118	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	6.1	122	70-130
79-00-5	1,1,2-Trichloroethane	5	6.1	122	70-130
87-61-6	1,2,3-Trichlorobenzene	5	5.3	106	70-130
96-18-4	1,2,3-Trichloropropane	5	5.8	116	70-130
120-82-1	1,2,4-Trichlorobenzene	5	5.0	100	70-130
95-63-6	1,2,4-Trimethylbenzene	5	5.0	100	70-130
108-67-8	1,3,5-Trimethylbenzene	5	5.1	102	70-130
127-18-4	Tetrachloroethylene	5	5.5	110	70-130
108-88-3	Toluene	5	5.0	100	70-130
79-01-6	Trichloroethylene	5	5.7	114	70-130
75-69-4	Trichlorofluoromethane	2	2.0	100	70-130
75-01-4	Vinyl chloride	2	1.9	95	70-130
	m,p-Xylene	10	10.3	103	70-130
95-47-6	o-Xylene	5	5.1	102	70-130
1330-20-7	Xylenes (total)	15	15.3	102	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	100%	70-130%
460-00-4	4-Bromofluorobenzene	87%	70-130%

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5378-BS	1B112625.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

5.2.1
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(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6802-BS	3A158040.D	1	11/08/17	BM	n/a	n/a	V3A6802

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
123-91-1	1,4-Dioxane	20	20.3	102	58-138

CAS No.	Surrogate Recoveries	BSP	Limits
17647-74-4	1,4-Dioxane-d8	93%	51-175%

* = Outside of Control Limits.

5.2.2
5

Matrix Spike Summary

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Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54963-1MS	1B112629.D	1	11/14/17	BK	n/a	n/a	V1B5378
JC54963-1	1B112626.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54963-1 ug/l	Spike Q	MS ug/l	MS %	Limits
67-64-1	Acetone	ND	20	20.9	105	41-142
78-93-3	2-Butanone	ND	20	21.6	108	55-129
71-43-2	Benzene	ND	5	5.2	104	53-138
108-86-1	Bromobenzene	ND	5	5.1	102	54-138
74-97-5	Bromochloromethane	ND	5	5.3	106	55-140
75-27-4	Bromodichloromethane	ND	5	5.7	114	57-147
75-25-2	Bromoform	ND	5	6.3	126	47-137
74-83-9	Bromomethane	ND	2	1.9	95	40-162
104-51-8	n-Butylbenzene	ND	5	4.3	86	45-144
135-98-8	sec-Butylbenzene	ND	5	4.5	90	46-145
98-06-6	tert-Butylbenzene	ND	5	4.2	84	48-141
75-15-0	Carbon disulfide	ND	5	6.0	120	35-127
108-90-7	Chlorobenzene	ND	5	5.2	104	54-135
75-00-3	Chloroethane	ND	2	1.9	95	38-153
67-66-3	Chloroform	ND	5	5.3	106	57-151
74-87-3	Chloromethane	ND	2	1.8	90	39-165
95-49-8	o-Chlorotoluene	ND	5	4.9	98	55-142
106-43-4	p-Chlorotoluene	ND	5	4.9	98	55-139
56-23-5	Carbon tetrachloride	ND	5	5.7	114	49-170
75-34-3	1,1-Dichloroethane	ND	5	5.4	108	55-149
75-35-4	1,1-Dichloroethylene	ND	5	5.4	108	42-142
563-58-6	1,1-Dichloropropene	ND	5	4.9	98	46-151
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	6.0	120	48-141
106-93-4	1,2-Dibromoethane	ND	5	5.2	104	57-135
107-06-2	1,2-Dichloroethane	ND	5	5.3	106	59-166
78-87-5	1,2-Dichloropropane	ND	5	5.2	104	53-142
142-28-9	1,3-Dichloropropane	ND	5	5.6	112	58-143
594-20-7	2,2-Dichloropropane	ND	5	4.4	88	38-165
124-48-1	Dibromochloromethane	ND	5	5.9	118	55-138
74-95-3	Dibromomethane	ND	5	5.4	108	61-144
75-71-8	Dichlorodifluoromethane	ND	2	2.1	105	23-172
541-73-1	m-Dichlorobenzene	ND	5	5.4	108	53-138
95-50-1	o-Dichlorobenzene	ND	5	5.5	110	54-140
106-46-7	p-Dichlorobenzene	ND	5	5.2	104	53-137
156-60-5	trans-1,2-Dichloroethylene	ND	5	5.0	100	47-148
156-59-2	cis-1,2-Dichloroethylene	ND	5	5.0	100	51-146

* = Outside of Control Limits.

5.3.1
5

Matrix Spike Summary

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54963-1MS	1B112629.D	1	11/14/17	BK	n/a	n/a	V1B5378
JC54963-1	1B112626.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54963-1 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	4.4	88	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	5.0	100	54-142
100-41-4	Ethylbenzene	ND	5	4.8	96	51-138
87-68-3	Hexachlorobutadiene	ND	5	4.9	98	40-154
591-78-6	2-Hexanone	ND	20	23.8	119	53-128
98-82-8	Isopropylbenzene	ND	5	4.2	84	49-139
99-87-6	p-Isopropyltoluene	ND	5	4.4	88	45-141
75-09-2	Methylene chloride	ND	5	5.4	108	54-137
1634-04-4	Methyl Tert Butyl Ether	ND	5	4.6	92	53-143
108-10-1	4-Methyl-2-pentanone	ND	20	23.8	119	58-127
91-20-3	Naphthalene	ND	5	4.6	92	44-140
103-65-1	n-Propylbenzene	ND	5	4.7	94	50-142
100-42-5	Styrene	ND	5	3.9	78	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	5.7	114	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	5.4	108	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	6.6	132	58-138
79-00-5	1,1,2-Trichloroethane	ND	5	6.0	120	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	4.9	98	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	6.3	126	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	4.5	90	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	4.6	92	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	4.6	92	45-138
127-18-4	Tetrachloroethylene	ND	5	5.1	102	45-145
108-88-3	Toluene	ND	5	4.6	92	52-134
79-01-6	Trichloroethylene	0.54	5	5.6	101	54-143
75-69-4	Trichlorofluoromethane	ND	2	1.9	95	36-167
75-01-4	Vinyl chloride	ND	2	1.8	90	35-162
	m,p-Xylene	ND	10	9.3	93	49-135
95-47-6	o-Xylene	ND	5	4.7	94	49-134
1330-20-7	Xylenes (total)	ND	15	13.9	93	50-134

CAS No.	Surrogate Recoveries	MS	JC54963-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	99%	87%	70-130%
460-00-4	4-Bromofluorobenzene	88%	79%	70-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54694-1MS	3A158045.D	1	11/08/17	BM	n/a	n/a	V3A6802
JC54694-1	3A158043.D	1	11/08/17	BM	n/a	n/a	V3A6802

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54694-1		Spike	MS	MS	Limits
		ug/l	Q	ug/l	ug/l	%	
123-91-1	1,4-Dioxane	ND		20	20.3	102	36-166

CAS No.	Surrogate Recoveries	MS	JC54694-1	Limits
17647-74-4	1,4-Dioxane-d8	98%	106%	51-175%

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54963-3DUP	1B112630.D	1	11/14/17	BK	n/a	n/a	V1B5378
JC54963-3	1B112628.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54963-3		DUP		Limits
		ug/l	Q	ug/l	Q	
67-64-1	Acetone	ND		ND		nc 10
78-93-3	2-Butanone	ND		ND		nc 12
71-43-2	Benzene	ND		ND		nc 10
108-86-1	Bromobenzene	ND		ND		nc 10
74-97-5	Bromochloromethane	ND		ND		nc 10
75-27-4	Bromodichloromethane	ND		ND		nc 10
75-25-2	Bromoform	ND		ND		nc 10
74-83-9	Bromomethane	ND		ND		nc 10
104-51-8	n-Butylbenzene	ND		ND		nc 10
135-98-8	sec-Butylbenzene	ND		ND		nc 10
98-06-6	tert-Butylbenzene	ND		ND		nc 10
75-15-0	Carbon disulfide	ND		ND		nc 19
108-90-7	Chlorobenzene	ND		ND		nc 10
75-00-3	Chloroethane	ND		ND		nc 10
67-66-3	Chloroform	ND		ND		nc 12
74-87-3	Chloromethane	ND		ND		nc 10
95-49-8	o-Chlorotoluene	ND		ND		nc 10
106-43-4	p-Chlorotoluene	ND		ND		nc 10
56-23-5	Carbon tetrachloride	ND		ND		nc 10
75-34-3	1,1-Dichloroethane	ND		ND		nc 10
75-35-4	1,1-Dichloroethylene	ND		ND		nc 10
563-58-6	1,1-Dichloropropene	ND		ND		nc 10
96-12-8	1,2-Dibromo-3-chloropropane	ND		ND		nc 10
106-93-4	1,2-Dibromoethane	ND		ND		nc 10
107-06-2	1,2-Dichloroethane	ND		ND		nc 10
78-87-5	1,2-Dichloropropane	ND		ND		nc 10
142-28-9	1,3-Dichloropropane	ND		ND		nc 10
594-20-7	2,2-Dichloropropane	ND		ND		nc 10
124-48-1	Dibromochloromethane	ND		ND		nc 10
74-95-3	Dibromomethane	ND		ND		nc 10
75-71-8	Dichlorodifluoromethane	ND		ND		nc 10
541-73-1	m-Dichlorobenzene	ND		ND		nc 10
95-50-1	o-Dichlorobenzene	ND		ND		nc 10
106-46-7	p-Dichlorobenzene	ND		ND		nc 10
156-60-5	trans-1,2-Dichloroethylene	ND		ND		nc 10
156-59-2	cis-1,2-Dichloroethylene	ND		ND		nc 10

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54963-3DUP	1B112630.D	1	11/14/17	BK	n/a	n/a	V1B5378
JC54963-3	1B112628.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54963-3		Q	RPD	Limits
		ug/l	ug/l			
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10	
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10	
100-41-4	Ethylbenzene	ND	ND	nc	10	
87-68-3	Hexachlorobutadiene	ND	ND	nc	10	
591-78-6	2-Hexanone	ND	ND	nc	10	
98-82-8	Isopropylbenzene	ND	ND	nc	10	
99-87-6	p-Isopropyltoluene	ND	ND	nc	10	
75-09-2	Methylene chloride	ND	ND	nc	10	
1634-04-4	Methyl Tert Butyl Ether	ND	ND	nc	10	
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10	
91-20-3	Naphthalene	ND	ND	nc	10	
103-65-1	n-Propylbenzene	ND	ND	nc	10	
100-42-5	Styrene	ND	ND	nc	10	
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10	
71-55-6	1,1,1-Trichloroethane	ND	ND	nc	10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10	
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10	
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10	
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10	
127-18-4	Tetrachloroethylene	ND	ND	nc	10	
108-88-3	Toluene	ND	ND	nc	10	
79-01-6	Trichloroethylene	0.53	0.60	12* a	10	
75-69-4	Trichlorofluoromethane	ND	ND	nc	10	
75-01-4	Vinyl chloride	ND	ND	nc	10	
	m,p-Xylene	ND	ND	nc	10	
95-47-6	o-Xylene	ND	ND	nc	10	
1330-20-7	Xylenes (total)	ND	ND	nc	10	

CAS No.	Surrogate Recoveries	DUP	JC54963-3	Limits
2199-69-1	1,2-Dichlorobenzene-d4	90%	90%	70-130%
460-00-4	4-Bromofluorobenzene	79%	78%	70-130%

* = Outside of Control Limits.

5.4.1
5

Duplicate Summary

Page 3 of 3

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54963-3DUP	1B112630.D	1	11/14/17	BK	n/a	n/a	V1B5378
JC54963-3	1B112628.D	1	11/14/17	BK	n/a	n/a	V1B5378

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

(a) Outside in house control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54686-1DUP	3A158059.D	1	11/08/17	BM	n/a	n/a	V3A6802
JC54686-1	3A158049.D	1	11/08/17	BM	n/a	n/a	V3A6802

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54694-1, JC54694-2, JC54694-3, JC54694-4, JC54694-5, JC54694-6, JC54694-7, JC54694-8

CAS No.	Compound	JC54686-1		DUP		Q	RPD	Limits
		ug/l	ug/l	ug/l	ug/l			
123-91-1	1,4-Dioxane	ND	ND	nc	37			

CAS No.	Surrogate Recoveries	DUP	JC54686-1	Limits
17647-74-4	1,4-Dioxane-d8	103%	102%	51-175%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5374-BFB	Injection Date:	11/09/17
Lab File ID:	1B112536.D	Injection Time:	17:23
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3098	17.4	Pass
75	30.0 - 80.0% of mass 95	8427	47.4	Pass
95	Base peak, 100% relative abundance	17763	100.0	Pass
96	5.0 - 9.0% of mass 95	1293	7.28	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	13718	77.2	Pass
175	5.0 - 9.0% of mass 174	1036	5.83	(7.55) ^a Pass
176	95.0 - 101.0% of mass 174	13518	76.1	(98.5) ^a Pass
177	5.0 - 9.0% of mass 176	947	5.33	(7.01) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5374-IC5374	1B112537.D	11/09/17	19:31	02:08	Initial cal 0.2
V1B5374-IC5374	1B112538.D	11/09/17	20:03	02:40	Initial cal 0.5
V1B5374-IC5374	1B112539.D	11/09/17	20:34	03:11	Initial cal 1
V1B5374-IC5374	1B112540.D	11/09/17	21:06	03:43	Initial cal 2
V1B5374-IC5374	1B112541.D	11/09/17	21:38	04:15	Initial cal 5
V1B5374-ICC5374	1B112542.D	11/09/17	22:10	04:47	Initial cal 10
V1B5374-IC5374	1B112543.D	11/09/17	22:42	05:19	Initial cal 20
V1B5374-IC5374	1B112544.D	11/09/17	23:15	05:52	Initial cal 40
V1B5374-IC5374	1B112545.D	11/09/17	23:47	06:24	Initial cal 80
V1B5374-ICV5374	1B112548.D	11/10/17	01:21	07:58	Initial cal verification 10

Instrument Performance Check (BFB)

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5378-BFB	Injection Date:	11/13/17
Lab File ID:	1B112622.D	Injection Time:	23:32
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	1686	18.5	Pass
75	30.0 - 80.0% of mass 95	4286	47.0	Pass
95	Base peak, 100% relative abundance	9122	100.0	Pass
96	5.0 - 9.0% of mass 95	668	7.32	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	7096	77.8	Pass
175	5.0 - 9.0% of mass 174	509	5.58	(7.17) ^a Pass
176	95.0 - 101.0% of mass 174	6894	75.6	(97.2) ^a Pass
177	5.0 - 9.0% of mass 176	519	5.69	(7.53) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5378-CC5374	1B112623.D	11/14/17	00:04	00:32	Continuing cal 10
V1B5378-MB	1B112624.D	11/14/17	00:36	01:04	Method Blank
V1B5378-BS	1B112625.D	11/14/17	01:08	01:36	Blank Spike
JC54963-1	1B112626.D	11/14/17	01:40	02:08	(used for QC only; not part of job JC54694)
ZZZZZZ	1B112627.D	11/14/17	02:11	02:39	(unrelated sample)
JC54963-3	1B112628.D	11/14/17	02:43	03:11	(used for QC only; not part of job JC54694)
JC54963-1MS	1B112629.D	11/14/17	03:15	03:43	Matrix Spike
JC54963-3DUP	1B112630.D	11/14/17	03:48	04:16	Duplicate
JC54694-1	1B112631.D	11/14/17	04:20	04:48	RW-1307RD110217
JC54694-2	1B112632.D	11/14/17	04:51	05:19	RW-1230PCC110217-F
JC54694-3	1B112633.D	11/14/17	05:23	05:51	RW-1230PCC110217
JC54694-4	1B112634.D	11/14/17	05:54	06:22	RW-901RD110217
JC54694-5	1B112635.D	11/14/17	06:26	06:54	RW-901RD110217-F
JC54694-6	1B112636.D	11/14/17	06:58	07:26	RW-921RD110217
JC54694-7	1B112637.D	11/14/17	07:30	07:58	RW-1213SSR110217
JC54694-8	1B112638.D	11/14/17	08:02	08:30	TRIP BLANK

Instrument Performance Check (BFB)

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6787-BFB	Injection Date:	09/27/17
Lab File ID:	3A157637.D	Injection Time:	09:47
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	8122	18.0	Pass
75	30.0 - 60.0% of mass 95	22219	49.3	Pass
95	Base peak, 100% relative abundance	45101	100.0	Pass
96	5.0 - 9.0% of mass 95	2935	6.51	Pass
173	Less than 2.0% of mass 174	240	0.53	(0.74) ^a Pass
174	50.0 - 120.0% of mass 95	32469	72.0	Pass
175	5.0 - 9.0% of mass 174	2483	5.51	(7.65) ^a Pass
176	95.0 - 101.0% of mass 174	30872	68.5	(95.1) ^a Pass
177	5.0 - 9.0% of mass 176	2102	4.66	(6.81) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6787-IC6787	3A157638.D	09/27/17	10:21	00:34	Initial cal 0.25
V3A6787-IC6787	3A157639.D	09/27/17	10:47	01:00	Initial cal 0.4
V3A6787-IC6787	3A157640.D	09/27/17	11:13	01:26	Initial cal 1
V3A6787-IC6787	3A157641.D	09/27/17	11:39	01:52	Initial cal 2
V3A6787-IC6787	3A157642.D	09/27/17	12:06	02:19	Initial cal 5
V3A6787-ICC6787	3A157643.D	09/27/17	12:32	02:45	Initial cal 20
V3A6787-IC6787	3A157644.D	09/27/17	12:58	03:11	Initial cal 50
V3A6787-IC6787	3A157645.D	09/27/17	13:24	03:37	Initial cal 100
V3A6787-IC6787	3A157646.D	09/27/17	13:49	04:02	Initial cal 200
V3A6787-ICV6787	3A157649.D	09/27/17	15:08	05:21	Initial cal verification 20
V3A6785-MB2	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6788-MB	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6785-BS2	3A157652.D	09/27/17	16:26	06:39	Blank Spike
V3A6788-BS	3A157652.D	09/27/17	16:26	06:39	Blank Spike
JC51376-1DUP	3A157654.D	09/27/17	17:18	07:31	Duplicate
ZZZZZZ	3A157655.D	09/27/17	17:43	07:56	(unrelated sample)
JC51376-4MS	3A157656.D	09/27/17	18:09	08:22	Matrix Spike
JC51468-2	3A157658.D	09/27/17	19:02	09:15	(used for QC only; not part of job JC54694)
ZZZZZZ	3A157659.D	09/27/17	19:28	09:41	(unrelated sample)
JC51468-5	3A157660.D	09/27/17	19:54	10:07	(used for QC only; not part of job JC54694)
JC51468-5DUP	3A157661.D	09/27/17	20:27	10:40	Duplicate
JC51468-2MS	3A157662.D	09/27/17	20:54	11:07	Matrix Spike

Instrument Performance Check (BFB)

Job Number: JC54694

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6802-BFB	Injection Date:	11/08/17
Lab File ID:	3A158036.D	Injection Time:	11:13
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	33053	16.5	Pass
75	30.0 - 60.0% of mass 95	97402	48.5	Pass
95	Base peak, 100% relative abundance	200725	100.0	Pass
96	5.0 - 9.0% of mass 95	13335	6.64	Pass
173	Less than 2.0% of mass 174	1243	0.62	(0.75) ^a Pass
174	50.0 - 120.0% of mass 95	164693	82.0	Pass
175	5.0 - 9.0% of mass 174	12023	5.99	(7.30) ^a Pass
176	95.0 - 101.0% of mass 174	158037	78.7	(96.0) ^a Pass
177	5.0 - 9.0% of mass 176	10381	5.17	(6.57) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6802-CC6787	3A158038.D	11/08/17	12:17	01:04	Continuing cal 20
V3A6802-MB	3A158039.D	11/08/17	12:50	01:37	Method Blank
V3A6802-BS	3A158040.D	11/08/17	13:16	02:03	Blank Spike
JC54694-8	3A158042.D	11/08/17	14:33	03:20	TRIP BLANK
JC54694-1	3A158043.D	11/08/17	15:11	03:58	RW-1307RD110217
JC54694-1MS	3A158045.D	11/08/17	16:05	04:52	Matrix Spike
JC54694-2	3A158046.D	11/08/17	16:32	05:19	RW-1230PCC110217-F
JC54686-1	3A158049.D	11/08/17	17:53	06:40	(used for QC only; not part of job JC54694)
ZZZZZZ	3A158050.D	11/08/17	18:19	07:06	(unrelated sample)
JC54694-3	3A158051.D	11/08/17	18:46	07:33	RW-1230PCC110217
JC54694-4	3A158052.D	11/08/17	19:13	08:00	RW-901RD110217
JC54694-5	3A158053.D	11/08/17	19:40	08:27	RW-901RD110217-F
JC54694-6	3A158054.D	11/08/17	20:07	08:54	RW-921RD110217
JC54694-7	3A158055.D	11/08/17	20:34	09:21	RW-1213SSR110217
ZZZZZZ	3A158056.D	11/08/17	21:00	09:47	(unrelated sample)
ZZZZZZ	3A158057.D	11/08/17	21:27	10:14	(unrelated sample)
ZZZZZZ	3A158058.D	11/08/17	21:53	10:40	(unrelated sample)
JC54686-1DUP	3A158059.D	11/08/17	22:20	11:07	Duplicate

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC54694

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC54694-1	1B112631.D	88	79
JC54694-2	1B112632.D	90	76
JC54694-3	1B112633.D	89	77
JC54694-4	1B112634.D	90	76
JC54694-5	1B112635.D	90	75
JC54694-6	1B112636.D	90	75
JC54694-7	1B112637.D	89	76
JC54694-8	1B112638.D	88	76
JC54963-1MS	1B112629.D	99	88
JC54963-3DUP	1B112630.D	90	79
V1B5378-BS	1B112625.D	100	87
V1B5378-MB	1B112624.D	89	79

Surrogate
Compounds

Recovery
Limits

S1 = 1,2-Dichlorobenzene-d4

70-130%

S2 = 4-Bromofluorobenzene

70-130%

5.6.1
5

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC54694

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC54694-1	3A158043.D	106
JC54694-2	3A158046.D	90
JC54694-3	3A158051.D	112
JC54694-4	3A158052.D	103
JC54694-5	3A158053.D	95
JC54694-6	3A158054.D	90
JC54694-7	3A158055.D	92
JC54694-8	3A158042.D	98
JC54686-1DUP	3A158059.D	103
JC54694-1MS	3A158045.D	98
V3A6802-BS	3A158040.D	93
V3A6802-MB	3A158039.D	105

Surrogate
Compounds

Recovery
Limits

S1 = 1,4-Dioxane-d8

51-175%

5.6.2
5

**ENCLOSURE B – LABORATORY ANALYTICAL REPORT FOR RESIDENTIAL
WELL SAMPLES, 1227 OLD CAMP MEADE ROAD
(OCTOBER 2017 THROUGH DECEMBER 2017)**



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11/16/17

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Automated Report

Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

31400389/03

SGS Accutest Job Number: JC54303

Sampling Date: 10/30/17



Report to:

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Total number of pages in report: 45



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**Nancy Cole
Laboratory Director**

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Sample Summary

WSP Environment & Energy

Job No: JC54303

Kop-Flex, Hanover, VA
Project No: 31400389/03

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC54303-1	10/30/17	10:45 CC	10/31/17	AQ Water	RW-12270CM-103017
JC54303-2	10/30/17	11:00 CC	10/31/17	AQ Water	RW-12270CM-103017-F
JC54303-3	10/30/17	11:00 CC	10/31/17	AQ Trip Blank Water	TRIP BLANK

Summary of Hits

Job Number: JC54303
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 10/30/17

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC54303-1	RW-12270CM-103017					
1,1-Dichloroethane ^a	0.24 J	0.50	0.13	ug/l	EPA 524.2 REV 4.1	
1,1-Dichloroethylene ^a	11.5	0.50	0.23	ug/l	EPA 524.2 REV 4.1	
1,1,1-Trichloroethane ^a	0.50	0.50	0.12	ug/l	EPA 524.2 REV 4.1	
1,4-Dioxane	2.6	0.40	0.29	ug/l	SW846 8260C BY SIM	
JC54303-2	RW-12270CM-103017-F					
1,1-Dichloroethane ^a	0.23 J	0.50	0.13	ug/l	EPA 524.2 REV 4.1	
1,1,1-Trichloroethane ^a	0.53	0.50	0.12	ug/l	EPA 524.2 REV 4.1	
1,4-Dioxane	2.6	0.40	0.29	ug/l	SW846 8260C BY SIM	
JC54303-3	TRIP BLANK					
Acetone ^a	9.7	5.0	3.8	ug/l	EPA 524.2 REV 4.1	

(a) EPA 524.2 is not a certified method for non-potable water samples.



ACCUTEST
New Jersey

Section 3

3

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: RW-12270CM-103017

Lab Sample ID: JC54303-1

Date Sampled: 10/30/17

Matrix: AQ - Water

Date Received: 10/31/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	1B112452.D	1	11/02/17 21:04	BK	n/a	n/a	V1B5369
Run #2 ^b	1B112566.D	1	11/10/17 18:35	BK	n/a	n/a	V1B5375

Purge Volume

Run #1	5.0 ml
Run #2	5.0 ml

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform ^c	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^c	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane ^c	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane ^c	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride ^c	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	0.24	0.50	0.13	ug/l	J
75-35-4	1,1-Dichloroethylene	11.5	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane ^c	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane ^c	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-12270CM-103017

Lab Sample ID: JC54303-1

Date Sampled: 10/30/17

Matrix: AQ - Water

Date Received: 10/31/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane ^c	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride ^c	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	92%	96%	70-130%
460-00-4	4-Bromofluorobenzene	78%	94%	70-130%

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-12270CM-103017	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-1	Date Received:	10/31/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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- (a) EPA 524.2 is not a certified method for non-potable water samples.
- (b) Confirmation run.
- (c) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-12270CM-103017

Lab Sample ID: JC54303-1

Matrix: AQ - Water

Method: SW846 8260C BY SIM

Project: Kop-Flex, Hanover, VA

Date Sampled: 10/30/17

Date Received: 10/31/17

Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A157969.D	1	11/01/17 20:35	PR	n/a	n/a	V3A6799
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	2.6	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	107%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-12270CM-103017-F	Date Sampled:	10/30/17				
Lab Sample ID:	JC54303-2	Date Received:	10/31/17				
Matrix:	AQ - Water	Percent Solids:	n/a				
Method:	EPA 524.2 REV 4.1						
Project:	Kop-Flex, Hanover, VA						
Run #1 ^a	File ID 1B112453.D	DF 1	Analyzed 11/02/17 21:36	By BK	Prep Date n/a	Prep Batch n/a	Analytical Batch V1B5369
Run #2 ^b	1B112567.D	1	11/10/17 19:07	BK	n/a	n/a	V1B5375
	Purge Volume						
Run #1	5.0 ml						
Run #2	5.0 ml						

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform ^c	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^c	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane ^c	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane ^c	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride ^c	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	0.23	0.50	0.13	ug/l	J
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane ^c	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane ^c	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-12270CM-103017-F	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-2	Date Received:	10/31/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.53	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane ^c	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride ^c	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	94%	96%	70-130%
460-00-4	4-Bromofluorobenzene	79%	92%	70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-12270CM-103017-F	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-2	Date Received:	10/31/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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- (a) EPA 524.2 is not a certified method for non-potable water samples.
- (b) Confirmation run.
- (c) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-12270CM-103017-F	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-2	Date Received:	10/31/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A157970.D	DF 1	Analyzed 11/01/17 21:01	By PR	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6799
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	2.6	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	105%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TRIP BLANK
Lab Sample ID: JC54303-3
Matrix: AQ - Trip Blank Water
Method: EPA 524.2 REV 4.1
Project: Kop-Flex, Hanover, VA

Date Sampled: 10/30/17
Date Received: 10/31/17
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	1B112454.D	1	11/02/17 22:08	BK	n/a	n/a	V1B5369
Run #2 ^b	1B112568.D	1	11/10/17 19:39	BK	n/a	n/a	V1B5375

Purge Volume
 Run #1 5.0 ml
 Run #2 5.0 ml

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	9.7	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform ^c	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^c	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane ^c	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane ^c	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride ^c	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane ^c	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane ^c	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-3	Date Received:	10/31/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane ^c	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride ^c	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	101%	98%	70-130%
460-00-4	4-Bromofluorobenzene	81%	93%	70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TRIP BLANK	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-3	Date Received:	10/31/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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- (a) EPA 524.2 is not a certified method for non-potable water samples.
- (b) Confirmation run.
- (c) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TRIP BLANK	Date Sampled:	10/30/17
Lab Sample ID:	JC54303-3	Date Received:	10/31/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A158009.D	DF 1	Analyzed 11/03/17 12:21	By PR	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6801
Run #2							

Purge Volume Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	103%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Project Name: KOP-Fley				WSP Parsons Brinckerhoff Contact Name: Eric Johnson				Requested Analyses & Preservatives				No. 004654	WSP	PARSONS BRINCKERHOFF
Project Location: Hanover, MD				WSP Parsons Brinckerhoff Contact E-mail: Eric.Johnson@wspgroup.com								Laboratory Name & Location: SGS Accutest		
Project Number & Task: 31400389/03				WSP Parsons Brinckerhoff Contact Phone: 703-291-6500								Laboratory Project Manager: Rokas Papers		
Sampler(s) Name(s): chris crespi				Sampler(s) Signature(s):				Number of Containers: 1 VOCs EPA 504 1,4-Dioxane (8260 SITE)				Requested Turn Around Time:		
												<input checked="" type="checkbox"/> 24 HR		
								<input type="checkbox"/> 48 HR			<input type="checkbox"/> 72 HR			
								<input type="checkbox"/>			_____ 5 Day			
Sample Comments: V74														
Sample Identification	Matrix	Collection Start*		Collection Stop*										
		Date	Time	Date	Time									
1	Rw 12270cm-100P	10/30/17	1045			G X								
2	Rw 12270CM-103017-F AQ	10/30/17	1100			G X X								
3	TRIP Blank	TB				2 X								
3	TRIP Blank	TB				3 X								
INITIAL ASSESSMENT: 3A - com														
LABEL VERIFICATION														
Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time	Shipment Method		Tracking Number(s)						
FX	10/31/17	915	FX					Custody Seal Number(s): 8377 8378						

*Use stop time/date for composite and/or air samples; use only start time/date for all other samples.

Matrix: AQ = Aqueous, S = Soil, SE = Sediment, A = Air, W = Wipe, B = Bulk, O = Other (detail in comments)

FX# 3074 7536 8768

ICE 4.0 c.v

JC54303: Chain of Custody

Page 1 of 3

SGS Accutest Sample Receipt Summary

Job Number: JC54303 Client: _____ Project: _____
 Date / Time Received: 10/31/2017 9:15:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (4.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.4);

Cooler Security	Y or N	Y or N	Sample Integrity - Documentation	Y or N		
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Container labeling complete:	<input checked="" type="checkbox"/>		
3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		
4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
Cooler Temperature			Y or N			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>					
2. Cooler temp verification:	IR Gun					
3. Cooler media:	Ice (Bag)					
4. No. Coolers:	1					
Quality Control Preservation			Y or N	N/A	Sample Integrity - Condition	Y or N
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2. All containers accounted for:	<input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			3. Condition of sample:	Intact
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
					Sample Integrity - Instructions	Y or N
					1. Analysis requested is clear:	<input checked="" type="checkbox"/>
					2. Bottles received for unspecified tests	<input type="checkbox"/>
					3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/>
					4. Compositing instructions clear:	<input type="checkbox"/>
					5. Filtering instructions clear:	<input type="checkbox"/>
						<input checked="" type="checkbox"/>

Comments

SM089-02
 Rev. Date 12/1/16

4.1

4

JC54303: Chain of Custody
 Page 2 of 3

Job Change Order: JC54303

Requested Date: 1/12/2017 Received Date: 10/31/2017
Account Name: WSP Environment & Energy Due Date: 1/17/2017
Project Description: Kop-Flex, Hanover, VA Deliverable:
C/O Initiated By: kristin.degra PM: RP COMMB
TAT (Days): 7

Sample #: JC54303-3 Change:
Dept: Please add V8260SIMDIOX
TAT: 7

TRIP BLANK

Above Changes Per: Client / Eric Johnson

Date/Time: 11/2/2017 3:12:25 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the SGS Accutest Client Service Representative.

Page 1 of 1

JC54303: Chain of Custody
Page 3 of 3

MS Volatiles**QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries

Method Blank Summary

Page 1 of 2

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5369-MB	1B112438.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

Page 2 of 2

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5369-MB	1B112438.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits
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2199-69-1	1,2-Dichlorobenzene-d4	95%	70-130%
460-00-4	4-Bromofluorobenzene	81%	70-130%

5.1.1
5

Method Blank Summary

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6799-MB	3A157947.D	1	11/01/17	PR	n/a	n/a	V3A6799

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-1, JC54303-2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.30	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8 96%	51-175%

Method Blank Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6801-MB	3A158005.D	1	11/03/17	PR	n/a	n/a	V3A6801

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-3

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8	98% 51-175%

5.1.3
5

Blank Spike Summary

Page 1 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5369-BS	1B112439.D	1	11/02/17	BK n/a	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	20.8	104	70-130
78-93-3	2-Butanone	20	16.9	85	70-130
71-43-2	Benzene	5	5.6	112	70-130
108-86-1	Bromobenzene	5	5.6	112	70-130
74-97-5	Bromochloromethane	5	6.1	122	70-130
75-27-4	Bromodichloromethane	5	6.2	124	70-130
75-25-2	Bromoform	5	6.0	120	70-130
74-83-9	Bromomethane	2	2.8	140* a	70-130
104-51-8	n-Butylbenzene	5	4.5	90	70-130
135-98-8	sec-Butylbenzene	5	4.8	96	70-130
98-06-6	tert-Butylbenzene	5	4.5	90	70-130
75-15-0	Carbon disulfide	5	6.2	124	70-130
108-90-7	Chlorobenzene	5	5.8	116	70-130
75-00-3	Chloroethane	2	2.7	135* a	70-130
67-66-3	Chloroform	5	6.0	120	70-130
74-87-3	Chloromethane	2	2.8	140* a	70-130
95-49-8	o-Chlorotoluene	5	5.3	106	70-130
106-43-4	p-Chlorotoluene	5	5.2	104	70-130
56-23-5	Carbon tetrachloride	5	6.3	126	70-130
75-34-3	1,1-Dichloroethane	5	6.1	122	70-130
75-35-4	1,1-Dichloroethylene	5	6.0	120	70-130
563-58-6	1,1-Dichloropropene	5	5.1	102	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	5.1	102	70-130
106-93-4	1,2-Dibromoethane	5	5.6	112	70-130
107-06-2	1,2-Dichloroethane	5	6.3	126	70-130
78-87-5	1,2-Dichloropropane	5	5.9	118	70-130
142-28-9	1,3-Dichloropropane	5	6.0	120	70-130
594-20-7	2,2-Dichloropropane	5	6.2	124	70-130
124-48-1	Dibromochloromethane	5	6.1	122	70-130
74-95-3	Dibromomethane	5	6.2	124	70-130
75-71-8	Dichlorodifluoromethane	2	3.0	150* a	70-130
541-73-1	m-Dichlorobenzene	5	5.9	118	70-130
95-50-1	o-Dichlorobenzene	5	6.0	120	70-130
106-46-7	p-Dichlorobenzene	5	5.7	114	70-130
156-60-5	trans-1,2-Dichloroethylene	5	5.4	108	70-130
156-59-2	cis-1,2-Dichloroethylene	5	5.5	110	70-130

* = Outside of Control Limits.

5.2.1
5

Blank Spike Summary

Page 2 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5369-BS	1B112439.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	4.8	96	70-130
10061-02-6	trans-1,3-Dichloropropene	5	5.3	106	70-130
100-41-4	Ethylbenzene	5	5.1	102	70-130
87-68-3	Hexachlorobutadiene	5	5.8	116	70-130
591-78-6	2-Hexanone	20	15.9	80	70-130
98-82-8	Isopropylbenzene	5	4.4	88	70-130
99-87-6	p-Isopropyltoluene	5	4.6	92	70-130
75-09-2	Methylene chloride	5	6.2	124	70-130
1634-04-4	Methyl Tert Butyl Ether	5	5.0	100	70-130
108-10-1	4-Methyl-2-pentanone	20	17.8	89	70-130
91-20-3	Naphthalene	5	4.1	82	70-130
103-65-1	n-Propylbenzene	5	5.0	100	70-130
100-42-5	Styrene	5	4.8	96	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	6.1	122	70-130
71-55-6	1,1,1-Trichloroethane	5	6.0	120	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	5.8	116	70-130
79-00-5	1,1,2-Trichloroethane	5	6.1	122	70-130
87-61-6	1,2,3-Trichlorobenzene	5	5.3	106	70-130
96-18-4	1,2,3-Trichloropropane	5	5.5	110	70-130
120-82-1	1,2,4-Trichlorobenzene	5	4.9	98	70-130
95-63-6	1,2,4-Trimethylbenzene	5	5.0	100	70-130
108-67-8	1,3,5-Trimethylbenzene	5	4.9	98	70-130
127-18-4	Tetrachloroethylene	5	5.9	118	70-130
108-88-3	Toluene	5	5.0	100	70-130
79-01-6	Trichloroethylene	5	5.7	114	70-130
75-69-4	Trichlorofluoromethane	2	2.7	135* a	70-130
75-01-4	Vinyl chloride	2	2.7	135* a	70-130
	m,p-Xylene	10	10.3	103	70-130
95-47-6	o-Xylene	5	4.9	98	70-130
1330-20-7	Xylenes (total)	15	15.1	101	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	105%	70-130%
460-00-4	4-Bromofluorobenzene	90%	70-130%

* = Outside of Control Limits.

5.2.1
5

Blank Spike Summary

Page 3 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5369-BS	1B112439.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6799-BS	3A157948.D	1	11/01/17	PR	n/a	n/a	V3A6799
V3A6799-BSD	3A157949.D	1	11/01/17	PR	n/a	n/a	V3A6799

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-1, JC54303-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
123-91-1	1,4-Dioxane	20	17.3	87	16.4	82	5	58-138/20

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
17647-74-4	1,4-Dioxane-d8	91%	86%	51-175%

* = Outside of Control Limits.

5.3.1
5

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6801-BS	3A158006.D	1	11/03/17	PR	n/a	n/a	V3A6801
V3A6801-BSD	3A158007.D	1	11/03/17	PR	n/a	n/a	V3A6801

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
123-91-1	1,4-Dioxane	20	16.7	84	16.3	82	2	58-138/20

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
17647-74-4	1,4-Dioxane-d8	86%	85%	51-175%

* = Outside of Control Limits.

5.3.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53952-2MS	1B112442.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2MSD	1B112446.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2	1B112440.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	JC53952-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	ND	20	19.0	95	20	19.9	100	5	41-142/24	
78-93-3	2-Butanone	ND	20	15.6	78	20	16.7	84	7	55-129/31	
71-43-2	Benzene	ND	5	5.8	116	5	6.6	132	13	53-138/16	
108-86-1	Bromobenzene	ND	5	5.9	118	5	6.7	134	13	54-138/17	
74-97-5	Bromochloromethane	ND	5	6.2	124	5	7.0	140	12	55-140/13	
75-27-4	Bromodichloromethane	ND	5	6.3	126	5	7.1	142	12* a	57-147/11	
75-25-2	Bromoform	ND	5	6.1	122	5	6.9	138* a	12	47-137/13	
74-83-9	Bromomethane	ND	2	2.3	115	2	2.6	130	12	40-162/27	
104-51-8	n-Butylbenzene	ND	5	4.9	98	5	5.5	110	12	45-144/19	
135-98-8	sec-Butylbenzene	ND	5	5.2	104	5	5.9	118	13	46-145/20	
98-06-6	tert-Butylbenzene	ND	5	4.7	94	5	5.2	104	10	48-141/17	
75-15-0	Carbon disulfide	ND	5	6.7	134* a	5	7.9	158* a	16	35-127/32	
108-90-7	Chlorobenzene	ND	5	6.1	122	5	6.8	136* a	11	54-135/15	
75-00-3	Chloroethane	ND	2	2.5	125	2	2.5	125	0	38-153/43	
67-66-3	Chloroform	ND	5	6.2	124	5	7.0	140	12	57-151/13	
74-87-3	Chloromethane	ND	2	2.5	125	2	2.6	130	4	39-165/35	
95-49-8	o-Chlorotoluene	ND	5	5.5	110	5	6.3	126	14	55-142/15	
106-43-4	p-Chlorotoluene	ND	5	5.5	110	5	6.2	124	12	55-139/20	
56-23-5	Carbon tetrachloride	ND	5	6.5	130	5	7.6	152	16	49-170/24	
75-34-3	1,1-Dichloroethane	1.4	5	7.4	120	5	8.3	138	11	55-149/13	
75-35-4	1,1-Dichloroethylene	ND	5	6.6	132	5	7.6	152* a	14	42-142/20	
563-58-6	1,1-Dichloropropene	ND	5	5.5	110	5	6.2	124	12	46-151/21	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	5.4	108	5	5.9	118	9	48-141/27	
106-93-4	1,2-Dibromoethane	ND	5	5.4	108	5	6.1	122	12* a	57-135/10	
107-06-2	1,2-Dichloroethane	ND	5	6.4	128	5	7.2	144	12	59-166/15	
78-87-5	1,2-Dichloropropane	ND	5	6.1	122	5	6.8	136	11	53-142/11	
142-28-9	1,3-Dichloropropane	ND	5	6.1	122	5	6.9	138	12	58-143/13	
594-20-7	2,2-Dichloropropane	ND	5	6.5	130	5	7.4	148	13	38-165/19	
124-48-1	Dibromochloromethane	ND	5	6.2	124	5	7.1	142* a	14	55-138/15	
74-95-3	Dibromomethane	ND	5	6.2	124	5	7.0	140	12* a	61-144/10	
75-71-8	Dichlorodifluoromethane	ND	2	2.6	130	2	2.8	140	7	23-172/30	
541-73-1	m-Dichlorobenzene	ND	5	6.3	126	5	7.1	142* a	12	53-138/17	
95-50-1	o-Dichlorobenzene	ND	5	6.5	130	5	7.1	142* a	9	54-140/11	
106-46-7	p-Dichlorobenzene	ND	5	6.0	120	5	6.8	136	13	53-137/14	
156-60-5	trans-1,2-Dichloroethylene	0.17	J	5	5.8	113	5	6.6	129	13	47-148/22
156-59-2	cis-1,2-Dichloroethylene	5.7		5	10.2	90	5	11.3	112	10	51-146/14

* = Outside of Control Limits.

5.4.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53952-2MS	1B112442.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2MSD	1B112446.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2	1B112440.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

CAS No.	Compound	JC53952-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
10061-01-5	cis-1,3-Dichloropropene	ND	5	4.6	92	5	5.1	102	10	51-136/11	
10061-02-6	trans-1,3-Dichloropropene	ND	5	5.1	102	5	5.8	116	13* a	54-142/10	
100-41-4	Ethylbenzene	ND	5	5.3	106	5	6.0	120	12	51-138/18	
87-68-3	Hexachlorobutadiene	ND	5	6.2	124	5	7.0	140	12	40-154/21	
591-78-6	2-Hexanone	ND	20	16.5	83	20	17.7	89	7	53-128/29	
98-82-8	Isopropylbenzene	ND	5	4.6	92	5	5.2	104	12	49-139/16	
99-87-6	p-Isopropyltoluene	ND	5	4.9	98	5	5.6	112	13	45-141/17	
75-09-2	Methylene chloride	ND	5	6.3	126	5	7.3	146* a	15* a	54-137/14	
1634-04-4	Methyl Tert Butyl Ether	0.93	5	5.6	94	5	6.4	110	13* a	53-143/10	
108-10-1	4-Methyl-2-pentanone	ND	20	17.9	90	20	19.5	98	9	58-127/32	
91-20-3	Naphthalene	ND	5	4.3	86	5	4.4	88	2	44-140/14	
103-65-1	n-Propylbenzene	ND	5	5.3	106	5	6.0	120	12	50-142/20	
100-42-5	Styrene	ND	5	5.1	102	5	5.8	116	13	23-130/20	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	6.4	128	5	7.4	148* a	14* a	57-144/11	
71-55-6	1,1,1-Trichloroethane	ND	5	6.4	128	5	7.3	146	13	52-164/13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	6.4	128	5	7.0	140* a	9	58-138/10	
79-00-5	1,1,2-Trichloroethane	ND	5	6.1	122	5	6.9	138	12* a	59-139/11	
87-61-6	1,2,3-Trichlorobenzene	ND	5	5.5	110	5	6.1	122	10	47-141/17	
96-18-4	1,2,3-Trichloropropane	ND	5	6.0	120	5	6.6	132	10	56-148/15	
120-82-1	1,2,4-Trichlorobenzene	ND	5	5.1	102	5	5.6	112	9	46-137/17	
95-63-6	1,2,4-Trimethylbenzene	ND	5	5.3	106	5	6.0	120	12	41-138/16	
108-67-8	1,3,5-Trimethylbenzene	ND	5	5.2	104	5	5.9	118	13	45-138/16	
127-18-4	Tetrachloroethylene	ND	5	6.9	138	5	7.3	146* a	6	45-145/19	
108-88-3	Toluene	ND	5	5.1	102	5	5.8	116	13	52-134/19	
79-01-6	Trichloroethylene	ND	5	6.3	126	5	6.9	138	9	54-143/15	
75-69-4	Trichlorofluoromethane	ND	2	2.4	120	2	2.6	130	8	36-167/28	
75-01-4	Vinyl chloride	ND	2	2.4	120	2	2.6	130	8	35-162/30	
	m,p-Xylene	ND	10	10.7	107	10	12.2	122	13	49-135/18	
95-47-6	o-Xylene	ND	5	5.1	102	5	5.7	114	11	49-134/19	
1330-20-7	Xylenes (total)	ND	15	15.8	105	15	18.0	120	13	50-134/18	

CAS No.	Surrogate Recoveries	MS	MSD	JC53952-2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	107%	109%	93%	70-130%
460-00-4	4-Bromofluorobenzene	88%	89%	77%	70-130%

* = Outside of Control Limits.

5.4.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC53952-2MS	1B112442.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2MSD	1B112446.D	1	11/02/17	BK	n/a	n/a	V1B5369
JC53952-2	1B112440.D	1	11/02/17	BK	n/a	n/a	V1B5369

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC54303-1, JC54303-2, JC54303-3

(a) Outside in house control limits.

* = Outside of Control Limits.

5.4.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54112-15MS	3A157960.D	1	11/01/17	PR	n/a	n/a	V3A6799
JC54112-15MSD	3A157961.D	1	11/01/17	PR	n/a	n/a	V3A6799
JC54112-15	3A157955.D	1	11/01/17	PR	n/a	n/a	V3A6799

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-1, JC54303-2

CAS No.	Compound	JC54112-15		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	ND		20	20.1	101	20	20.3	102	1	36-166/26

CAS No.	Surrogate Recoveries	MS	MSD	JC54112-15	Limits
17647-74-4	1,4-Dioxane-d8	108%	112%	127%	51-175%

* = Outside of Control Limits.

5.4.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC54532-1MS	3A158018.D	1	11/03/17	PR	n/a	n/a	V3A6801
JC54532-1MSD	3A158019.D	1	11/03/17	PR	n/a	n/a	V3A6801
JC54532-1	3A158011A.D	1	11/03/17	PR	n/a	n/a	V3A6801

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC54303-3

CAS No.	Compound	JC54532-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	11.7	20	32.6	105	20	31.3	98	4	36-166/26	

CAS No.	Surrogate Recoveries	MS	MSD	JC54532-1	Limits
17647-74-4	1,4-Dioxane-d8	110%	107%	104%	51-175%

* = Outside of Control Limits.

5.4.3
5

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5360-BFB	Injection Date:	10/25/17
Lab File ID:	1B112259.D	Injection Time:	10:25
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3297	17.0	Pass
75	30.0 - 80.0% of mass 95	8927	46.1	Pass
95	Base peak, 100% relative abundance	19357	100.0	Pass
96	5.0 - 9.0% of mass 95	1347	6.96	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	15475	79.9	Pass
175	5.0 - 9.0% of mass 174	1091	5.64	(7.05) ^a Pass
176	95.0 - 101.0% of mass 174	14990	77.4	(96.9) ^a Pass
177	5.0 - 9.0% of mass 176	1032	5.33	(6.88) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5360-IC5360	1B112260.D	10/25/17	11:06	00:41	Initial cal 0.2
V1B5360-IC5360	1B112261.D	10/25/17	11:38	01:13	Initial cal 0.5
V1B5360-IC5360	1B112262.D	10/25/17	12:10	01:45	Initial cal 1
V1B5360-IC5360	1B112263.D	10/25/17	12:41	02:16	Initial cal 2
V1B5360-IC5360	1B112264.D	10/25/17	13:13	02:48	Initial cal 5
V1B5360-ICC5360	1B112265.D	10/25/17	13:45	03:20	Initial cal 10
V1B5360-IC5360	1B112266.D	10/25/17	14:17	03:52	Initial cal 20
V1B5360-IC5360	1B112267.D	10/25/17	14:49	04:24	Initial cal 40
V1B5360-IC5360	1B112268.D	10/25/17	15:20	04:55	Initial cal 80
V1B5360-ICV5360	1B112270.D	10/25/17	16:30	06:05	Initial cal verification 10
V1B5360-ICV5360	1B112271.D	10/25/17	17:07	06:42	Initial cal verification 10
V1B5358-MB2	1B112273.D	10/25/17	18:10	07:45	Method Blank
V1B5358-BS2	1B112274.D	10/25/17	18:41	08:16	Blank Spike
JC53497-3DUP	1B112275.D	10/25/17	19:27	09:02	Duplicate

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5369-BFB	Injection Date:	11/02/17
Lab File ID:	1B112435.D	Injection Time:	11:56
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	2560	18.4	Pass
75	30.0 - 80.0% of mass 95	6814	49.0	Pass
95	Base peak, 100% relative abundance	13915	100.0	Pass
96	5.0 - 9.0% of mass 95	973	6.99	Pass
173	Less than 2.0% of mass 174	60	0.43	(0.49) ^a Pass
174	50.0 - 120.0% of mass 95	12134	87.2	Pass
175	5.0 - 9.0% of mass 174	934	6.71	(7.70) ^a Pass
176	95.0 - 101.0% of mass 174	11772	84.6	(97.0) ^a Pass
177	5.0 - 9.0% of mass 176	748	5.38	(6.35) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5369-CC5360	1B112437.D	11/02/17	13:05	01:09	Continuing cal 10
V1B5369-MB	1B112438.D	11/02/17	13:36	01:40	Method Blank
V1B5369-BS	1B112439.D	11/02/17	14:07	02:11	Blank Spike
JC53952-2	1B112440.D	11/02/17	14:47	02:51	(used for QC only; not part of job JC54303)
ZZZZZZ	1B112441.D	11/02/17	15:19	03:23	(unrelated sample)
JC53952-2MS	1B112442.D	11/02/17	15:50	03:54	Matrix Spike
ZZZZZZ	1B112444.D	11/02/17	16:53	04:57	(unrelated sample)
ZZZZZZ	1B112445.D	11/02/17	17:24	05:28	(unrelated sample)
JC53952-2MSD	1B112446.D	11/02/17	17:55	05:59	Matrix Spike Duplicate
ZZZZZZ	1B112447.D	11/02/17	18:27	06:31	(unrelated sample)
ZZZZZZ	1B112448.D	11/02/17	18:58	07:02	(unrelated sample)
ZZZZZZ	1B112449.D	11/02/17	19:30	07:34	(unrelated sample)
ZZZZZZ	1B112450.D	11/02/17	20:01	08:05	(unrelated sample)
ZZZZZZ	1B112451.D	11/02/17	20:33	08:37	(unrelated sample)
JC54303-1	1B112452.D	11/02/17	21:04	09:08	RW-12270CM-103017
JC54303-2	1B112453.D	11/02/17	21:36	09:40	RW-12270CM-103017-F
JC54303-3	1B112454.D	11/02/17	22:08	10:12	TRIP BLANK
ZZZZZZ	1B112455.D	11/02/17	22:40	10:44	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5374-BFB	Injection Date:	11/09/17
Lab File ID:	1B112536.D	Injection Time:	17:23
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3098	17.4	Pass
75	30.0 - 80.0% of mass 95	8427	47.4	Pass
95	Base peak, 100% relative abundance	17763	100.0	Pass
96	5.0 - 9.0% of mass 95	1293	7.28	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	13718	77.2	Pass
175	5.0 - 9.0% of mass 174	1036	5.83	(7.55) ^a Pass
176	95.0 - 101.0% of mass 174	13518	76.1	(98.5) ^a Pass
177	5.0 - 9.0% of mass 176	947	5.33	(7.01) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5374-IC5374	1B112537.D	11/09/17	19:31	02:08	Initial cal 0.2
V1B5374-IC5374	1B112538.D	11/09/17	20:03	02:40	Initial cal 0.5
V1B5374-IC5374	1B112539.D	11/09/17	20:34	03:11	Initial cal 1
V1B5374-IC5374	1B112540.D	11/09/17	21:06	03:43	Initial cal 2
V1B5374-IC5374	1B112541.D	11/09/17	21:38	04:15	Initial cal 5
V1B5374-ICC5374	1B112542.D	11/09/17	22:10	04:47	Initial cal 10
V1B5374-IC5374	1B112543.D	11/09/17	22:42	05:19	Initial cal 20
V1B5374-IC5374	1B112544.D	11/09/17	23:15	05:52	Initial cal 40
V1B5374-IC5374	1B112545.D	11/09/17	23:47	06:24	Initial cal 80
V1B5374-ICV5374	1B112548.D	11/10/17	01:21	07:58	Initial cal verification 10

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5375-BFB	Injection Date:	11/10/17
Lab File ID:	1B112552.D	Injection Time:	10:44
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	3301	18.4	Pass
75	30.0 - 80.0% of mass 95	8961	50.0	Pass
95	Base peak, 100% relative abundance	17931	100.0	Pass
96	5.0 - 9.0% of mass 95	1288	7.18	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	13507	75.3	Pass
175	5.0 - 9.0% of mass 174	1119	6.24	(8.28) ^a Pass
176	95.0 - 101.0% of mass 174	13224	73.7	(97.9) ^a Pass
177	5.0 - 9.0% of mass 176	914	5.10	(6.91) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5375-CC5374	1B112553.D	11/10/17	11:37	00:53	Continuing cal 5
V1B5375-MB	1B112554.D	11/10/17	12:12	01:28	Method Blank
V1B5375-BS	1B112555.D	11/10/17	12:43	01:59	Blank Spike
V1B5375-BSD	1B112556.D	11/10/17	13:16	02:32	Blank Spike Duplicate
JC54759-1	1B112557.D	11/10/17	13:48	03:04	(used for QC only; not part of job JC54303)
JC54759-2	1B112558.D	11/10/17	14:20	03:36	(used for QC only; not part of job JC54303)
ZZZZZZ	1B112559.D	11/10/17	14:52	04:08	(unrelated sample)
ZZZZZZ	1B112560.D	11/10/17	15:24	04:40	(unrelated sample)
ZZZZZZ	1B112561.D	11/10/17	15:55	05:11	(unrelated sample)
ZZZZZZ	1B112562.D	11/10/17	16:28	05:44	(unrelated sample)
ZZZZZZ	1B112563.D	11/10/17	16:59	06:15	(unrelated sample)
JC54759-1MS	1B112564.D	11/10/17	17:31	06:47	Matrix Spike
JC54759-2DUP	1B112565.D	11/10/17	18:03	07:19	Duplicate
JC54303-1	1B112566.D	11/10/17	18:35	07:51	RW-12270CM-103017
JC54303-2	1B112567.D	11/10/17	19:07	08:23	RW-12270CM-103017-F
JC54303-3	1B112568.D	11/10/17	19:39	08:55	TRIP BLANK
ZZZZZZ	1B112569.D	11/10/17	20:11	09:27	(unrelated sample)
ZZZZZZ	1B112570.D	11/10/17	20:43	09:59	(unrelated sample)
ZZZZZZ	1B112571.D	11/10/17	21:15	10:31	(unrelated sample)
ZZZZZZ	1B112572.D	11/10/17	21:48	11:04	(unrelated sample)
ZZZZZZ	1B112573.D	11/10/17	22:19	11:35	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6787-BFB	Injection Date:	09/27/17
Lab File ID:	3A157637.D	Injection Time:	09:47
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	8122	18.0	Pass
75	30.0 - 60.0% of mass 95	22219	49.3	Pass
95	Base peak, 100% relative abundance	45101	100.0	Pass
96	5.0 - 9.0% of mass 95	2935	6.51	Pass
173	Less than 2.0% of mass 174	240	0.53	(0.74) ^a Pass
174	50.0 - 120.0% of mass 95	32469	72.0	Pass
175	5.0 - 9.0% of mass 174	2483	5.51	(7.65) ^a Pass
176	95.0 - 101.0% of mass 174	30872	68.5	(95.1) ^a Pass
177	5.0 - 9.0% of mass 176	2102	4.66	(6.81) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6787-IC6787	3A157638.D	09/27/17	10:21	00:34	Initial cal 0.25
V3A6787-IC6787	3A157639.D	09/27/17	10:47	01:00	Initial cal 0.4
V3A6787-IC6787	3A157640.D	09/27/17	11:13	01:26	Initial cal 1
V3A6787-IC6787	3A157641.D	09/27/17	11:39	01:52	Initial cal 2
V3A6787-IC6787	3A157642.D	09/27/17	12:06	02:19	Initial cal 5
V3A6787-ICC6787	3A157643.D	09/27/17	12:32	02:45	Initial cal 20
V3A6787-IC6787	3A157644.D	09/27/17	12:58	03:11	Initial cal 50
V3A6787-IC6787	3A157645.D	09/27/17	13:24	03:37	Initial cal 100
V3A6787-IC6787	3A157646.D	09/27/17	13:49	04:02	Initial cal 200
V3A6787-ICV6787	3A157649.D	09/27/17	15:08	05:21	Initial cal verification 20
V3A6785-MB2	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6788-MB	3A157651.D	09/27/17	16:00	06:13	Method Blank
V3A6785-BS2	3A157652.D	09/27/17	16:26	06:39	Blank Spike
V3A6788-BS	3A157652.D	09/27/17	16:26	06:39	Blank Spike
JC51376-1DUP	3A157654.D	09/27/17	17:18	07:31	Duplicate
ZZZZZZ	3A157655.D	09/27/17	17:43	07:56	(unrelated sample)
JC51376-4MS	3A157656.D	09/27/17	18:09	08:22	Matrix Spike
JC51468-2	3A157658.D	09/27/17	19:02	09:15	(used for QC only; not part of job JC54303)
ZZZZZZ	3A157659.D	09/27/17	19:28	09:41	(unrelated sample)
JC51468-5	3A157660.D	09/27/17	19:54	10:07	(used for QC only; not part of job JC54303)
JC51468-5DUP	3A157661.D	09/27/17	20:27	10:40	Duplicate
JC51468-2MS	3A157662.D	09/27/17	20:54	11:07	Matrix Spike

Instrument Performance Check (BFB)

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6799-BFB	Injection Date:	11/01/17
Lab File ID:	3A157945.D	Injection Time:	09:58
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	6854	16.1	Pass
75	30.0 - 60.0% of mass 95	20354	47.8	Pass
95	Base peak, 100% relative abundance	42605	100.0	Pass
96	5.0 - 9.0% of mass 95	3145	7.38	Pass
173	Less than 2.0% of mass 174	331	0.78	(0.94) ^a Pass
174	50.0 - 120.0% of mass 95	35202	82.6	Pass
175	5.0 - 9.0% of mass 174	2542	5.97	(7.22) ^a Pass
176	95.0 - 101.0% of mass 174	33944	79.7	(96.4) ^a Pass
177	5.0 - 9.0% of mass 176	2439	5.72	(7.19) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6799-CC6787	3A157946.D	11/01/17	10:29	00:31	Continuing cal 20
V3A6799-MB	3A157947.D	11/01/17	11:02	01:04	Method Blank
V3A6799-BS	3A157948.D	11/01/17	11:34	01:36	Blank Spike
V3A6799-BSD	3A157949.D	11/01/17	11:59	02:01	Blank Spike Duplicate
ZZZZZZ	3A157951.D	11/01/17	12:51	02:53	(unrelated sample)
ZZZZZZ	3A157952.D	11/01/17	13:17	03:19	(unrelated sample)
ZZZZZZ	3A157953.D	11/01/17	13:43	03:45	(unrelated sample)
ZZZZZZ	3A157954.D	11/01/17	14:08	04:10	(unrelated sample)
JC54112-15	3A157955.D	11/01/17	14:34	04:36	(used for QC only; not part of job JC54303)
ZZZZZZ	3A157956.D	11/01/17	15:00	05:02	(unrelated sample)
ZZZZZZ	3A157957.D	11/01/17	15:25	05:27	(unrelated sample)
ZZZZZZ	3A157958.D	11/01/17	15:51	05:53	(unrelated sample)
ZZZZZZ	3A157959.D	11/01/17	16:17	06:19	(unrelated sample)
JC54112-15MS	3A157960.D	11/01/17	16:43	06:45	Matrix Spike
JC54112-15MSD	3A157961.D	11/01/17	17:08	07:10	Matrix Spike Duplicate
ZZZZZZ	3A157963.D	11/01/17	18:00	08:02	(unrelated sample)
ZZZZZZ	3A157964.D	11/01/17	18:26	08:28	(unrelated sample)
ZZZZZZ	3A157965.D	11/01/17	18:52	08:54	(unrelated sample)
ZZZZZZ	3A157966.D	11/01/17	19:17	09:19	(unrelated sample)
ZZZZZZ	3A157967.D	11/01/17	19:43	09:45	(unrelated sample)
ZZZZZZ	3A157968.D	11/01/17	20:09	10:11	(unrelated sample)
JC54303-1	3A157969.D	11/01/17	20:35	10:37	RW-12270CM-103017
JC54303-2	3A157970.D	11/01/17	21:01	11:03	RW-12270CM-103017-F

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6801-BFB	Injection Date:	11/03/17
Lab File ID:	3A158003.D	Injection Time:	09:04
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	6658	15.2	Pass
75	30.0 - 60.0% of mass 95	20669	47.2	Pass
95	Base peak, 100% relative abundance	43816	100.0	Pass
96	5.0 - 9.0% of mass 95	2644	6.03	Pass
173	Less than 2.0% of mass 174	206	0.47	(0.59) ^a Pass
174	50.0 - 120.0% of mass 95	34989	79.9	Pass
175	5.0 - 9.0% of mass 174	2584	5.90	(7.39) ^a Pass
176	95.0 - 101.0% of mass 174	34136	77.9	(97.6) ^a Pass
177	5.0 - 9.0% of mass 176	2463	5.62	(7.22) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6801-CC6787	3A158004.D	11/03/17	09:45	00:41	Continuing cal 5
V3A6801-MB	3A158005.D	11/03/17	10:27	01:23	Method Blank
V3A6801-BS	3A158006.D	11/03/17	11:03	01:59	Blank Spike
V3A6801-BSD	3A158007.D	11/03/17	11:29	02:25	Blank Spike Duplicate
JC54303-3	3A158009.D	11/03/17	12:21	03:17	TRIP BLANK
JC54532-1	3A158011A.D	11/03/17	13:39	04:35	(used for QC only; not part of job JC54303)
ZZZZZZ	3A158012.D	11/03/17	14:05	05:01	(unrelated sample)
ZZZZZZ	3A158013.D	11/03/17	14:31	05:27	(unrelated sample)
ZZZZZZ	3A158014.D	11/03/17	14:57	05:53	(unrelated sample)
ZZZZZZ	3A158015.D	11/03/17	15:23	06:19	(unrelated sample)
ZZZZZZ	3A158016.D	11/03/17	15:49	06:45	(unrelated sample)
ZZZZZZ	3A158017.D	11/03/17	16:15	07:11	(unrelated sample)
JC54532-1MS	3A158018.D	11/03/17	16:41	07:37	Matrix Spike
JC54532-1MSD	3A158019.D	11/03/17	17:07	08:03	Matrix Spike Duplicate
ZZZZZZ	3A158021.D	11/03/17	17:59	08:55	(unrelated sample)
ZZZZZZ	3A158022.D	11/03/17	18:25	09:21	(unrelated sample)
ZZZZZZ	3A158023.D	11/03/17	18:51	09:47	(unrelated sample)
ZZZZZZ	3A158024.D	11/03/17	19:17	10:13	(unrelated sample)
ZZZZZZ	3A158025.D	11/03/17	19:43	10:39	(unrelated sample)
ZZZZZZ	3A158026.D	11/03/17	20:09	11:05	(unrelated sample)
ZZZZZZ	3A158027.D	11/03/17	20:35	11:31	(unrelated sample)
ZZZZZZ	3A158028.D	11/03/17	21:01	11:57	(unrelated sample)

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC54303

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC54303-1	1B112566.D	96	94
JC54303-1	1B112452.D	92	78
JC54303-2	1B112567.D	96	92
JC54303-2	1B112453.D	94	79
JC54303-3	1B112568.D	98	93
JC54303-3	1B112454.D	101	81
JC53952-2MS	1B112442.D	107	88
JC53952-2MSD	1B112446.D	109	89
V1B5369-BS	1B112439.D	105	90
V1B5369-MB	1B112438.D	95	81

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = 1,2-Dichlorobenzene-d4	70-130%
S2 = 4-Bromofluorobenzene	70-130%

5.6.1
5

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC54303

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC54303-1	3A157969.D	107
JC54303-2	3A157970.D	105
JC54303-3	3A158009.D	103
JC54112-15MS	3A157960.D	108
JC54112-15MSD	3A157961.D	112
JC54532-1MS	3A158018.D	110
JC54532-1MSD	3A158019.D	107
V3A6799-BS	3A157948.D	91
V3A6799-BSD	3A157949.D	86
V3A6799-MB	3A157947.D	96
V3A6801-BS	3A158006.D	86
V3A6801-BSD	3A158007.D	85
V3A6801-MB	3A158005.D	98

Surrogate
Compounds Recovery
 Limits

S1 = 1,4-Dioxane-d8 51-175%

5.6.2
5



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Automated Report

Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

31400389/03

SGS Accutest Job Number: JC56376

Sampling Date: 11/30/17



Report to:

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Total number of pages in report: 43



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Sample Summary

WSP Environment & Energy

Job No: JC56376

Kop-Flex, Hanover, VA
Project No: 31400389/03

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC56376-1	11/30/17	10:45 MJK	12/01/17	AQ Water	RW-12270CM-113017
JC56376-2	11/30/17	10:35 MJK	12/01/17	AQ Water	RW-12270CM-113017-F
JC56376-3	11/30/17	10:45 MJK	12/01/17	AQ Trip Blank Water	TB-113017

Summary of Hits

Job Number: JC56376
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 11/30/17

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

JC56376-1 RW-12270CM-113017

1,1-Dichloroethane ^a	0.16 J	0.50	0.13	ug/l	EPA 524.2 REV 4.1
1,1-Dichloroethylene ^a	6.0	0.50	0.23	ug/l	EPA 524.2 REV 4.1
1,1,1-Trichloroethane ^a	0.30 J	0.50	0.12	ug/l	EPA 524.2 REV 4.1
1,4-Dioxane	2.3	0.40	0.29	ug/l	SW846 8260C BY SIM

JC56376-2 RW-12270CM-113017-F

1,1-Dichloroethane ^a	0.17 J	0.50	0.13	ug/l	EPA 524.2 REV 4.1
1,1-Dichloroethylene ^a	1.9	0.50	0.23	ug/l	EPA 524.2 REV 4.1
1,1,1-Trichloroethane ^a	0.34 J	0.50	0.12	ug/l	EPA 524.2 REV 4.1
1,4-Dioxane	2.4	0.40	0.29	ug/l	SW846 8260C BY SIM

JC56376-3 TB-113017

No hits reported in this sample.

(a) EPA 524.2 is not a certified method for non-potable water samples.



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Section 3

3

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 3

3

Client Sample ID: RW-12270CM-113017

Lab Sample ID: JC56376-1

Date Sampled: 11/30/17

Matrix: AQ - Water

Date Received: 12/01/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	4D84320.D	1	12/04/17 13:25	RS	n/a	n/a	V4D3636
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^b	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	0.16	0.50	0.13	ug/l	J
75-35-4	1,1-Dichloroethylene	6.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-12270CM-113017

Lab Sample ID: JC56376-1

Date Sampled: 11/30/17

Matrix: AQ - Water

Date Received: 12/01/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.30	0.50	0.12	ug/l	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	99%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-12270CM-113017	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-1	Date Received:	12/01/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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- (a) EPA 524.2 is not a certified method for non-potable water samples.
(b) This compound in BS is outside in house QC limits bias high.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-12270CM-113017

Lab Sample ID: JC56376-1

Date Sampled: 11/30/17

Matrix: AQ - Water

Date Received: 12/01/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158458.D	1	12/06/17 18:47	BM	n/a	n/a	V3A6817
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
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123-91-1	1,4-Dioxane	2.3	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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17647-74-4	1,4-Dioxane-d8	105%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-12270CM-113017-F	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-2	Date Received:	12/01/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		
Run #1 ^a	File ID 4D84321.D	DF 1	Analyzed 12/04/17 13:58 By RS Prep Date n/a Prep Batch n/a Analytical Batch V4D3636
Run #2			
	Purge Volume 5.0 ml		
Run #1			
Run #2			

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^b	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	0.17	0.50	0.13	ug/l	J
75-35-4	1,1-Dichloroethylene	1.9	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	RW-12270CM-113017-F	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-2	Date Received:	12/01/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.34	0.50	0.12	ug/l	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	101%		70-130%
460-00-4	4-Bromofluorobenzene	95%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-12270CM-113017-F	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-2	Date Received:	12/01/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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- (a) EPA 524.2 is not a certified method for non-potable water samples.
(b) This compound in BS is outside in house QC limits bias high.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Client Sample ID:	RW-12270CM-113017-F	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-2	Date Received:	12/01/17
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158459.D	1	12/06/17 19:13	BM	n/a	n/a	V3A6817
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	2.4	0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits						
17647-74-4	1,4-Dioxane-d8	108%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TB-113017
 Lab Sample ID: JC56376-3
 Matrix: AQ - Trip Blank Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 11/30/17
 Date Received: 12/01/17
 Percent Solids: n/a

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	4D84322.D	1	12/04/17 14:30	RS	n/a	n/a	V4D3636

Purge Volume
 Run #1 5.0 ml
 Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane ^b	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	TB-113017	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-3	Date Received:	12/01/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	99%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

3
3

Client Sample ID:	TB-113017	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-3	Date Received:	12/01/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

- (a) EPA 524.2 is not a certified method for non-potable water samples.
(b) This compound in BS is outside in house QC limits bias high.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-113017	Date Sampled:	11/30/17
Lab Sample ID:	JC56376-3	Date Received:	12/01/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

Run #1	File ID 3A158460.D	DF 1	Analyzed 12/06/17 19:39	By BM	Prep Date n/a	Prep Batch n/a	Analytical Batch V3A6817
Run #2							

Purge Volume Run #1 5.0 ml
Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
17647-74-4	1,4-Dioxane-d8	117%		51-175%		

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



ACCUTEST

WW
W7B

CHAIN OF CUSTODY

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

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FED-EX Tracking # 3250 6932 9551
Bottle Order Control # JC56376
SGS Accutest Quote #
SGS Accutest Job #

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)		Matrix Codes											
Company Name WSP	Project Name: HufFlex	Street Address 13530 Dulks Technology Drive Suite 300	City Hesnuden VA	State VA	Zip 20171	Billing Information (if different from Report to) Company Name											
Project Contact Eric Johnson E-mail: eric.johnson@wsp.com	Project # 31400389/03	Street Address															
Phone # (703)709-6500	Fax #	Client Purchase Order #	City	State	Zip												
Sampler(s) Name(s) MSK + SLB	Phone #	Project Manager	Attention:														
SGS Account Sample #	Field ID / Point of Collection	Collection		Number of preserved Bottles													
	MEOH/DI vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	HDSO4	NONE	DI Water	MECH	ENCORE			
1	RW-12270CM-113017	11/30/17	1045	MSK	WW	6	X										
2	RW-12270CM-113017-F	11/30/17	1035	MSK	WW	6	X										
3	TB-113017				DW	4	X										
Turnaround Time (Business days)		Data Deliverable Information						Comments / Special Instructions									
<input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		Approved By (SGS Accutest PM): / Date: _____ <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLTI (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting <small>NJ Reduced = Results + QC Summary + Partial Raw data</small>						<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____ <small>INITIAL ASSESSMENT 1A/28</small> <small>LABEL VERIFICATION</small>									
Emergency & Rush T/A data available VIA Lablink														Sample inventory is verified upon receipt in the Laboratory			
Sample Custody must be documented below each time samples change possession, including courier delivery.														9:50			
1	Maricela Colon	Date Time: 11/30/17 1330	Received By: fedex	Relinquished By: fedex	Date Time: 11/11/17	Received By: A											
2		Date Time: 3	Received By: 3	Relinquished By: 4	Date Time: 4	Received By: 4											
3		Date Time: 5	Received By: 5	Custody Seal # ←	Preserved where applicable	On Ice <input type="checkbox"/>	Cooler Temp: 1.9°C										

Form:SM088-01CRev.Date:9/13/16

JC56376: Chain of Custody

Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: JC56376 Client: _____ Project: _____
 Date / Time Received: 12/1/2017 9:50:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (1.9);

Cooler Temps (Corrected) °C: Cooler 1: (2.8);

Cooler Security	<u>Y or N</u>	<u>Y or N</u>	Sample Integrity - Documentation	<u>Y or N</u>		
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>		
Cooler Temperature		<u>Y or N</u>	Sample Integrity - Condition			
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>		
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact		
4. No. Coolers:	1					
Quality Control Preservation		<u>Y or N</u>	<u>N/A</u>	Sample Integrity - Instructions	<u>Y or N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	
			5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments

SM089-02
Rev. Date 12/1/16

4.1

4

JC56376: Chain of Custody
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MS Volatiles**QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries

Method Blank Summary

Page 1 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-MB	4D84314.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

Method Blank Summary

Page 2 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-MB	4D84314.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits	
2199-69-1	1,2-Dichlorobenzene-d4	101%	70-130%
460-00-4	4-Bromofluorobenzene	99%	70-130%

5.1.1
5

Method Blank Summary

Page 3 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-MB	4D84314.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method:

JC56376-1, JC56376-2, JC56376-3

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

5.1.1
5

Method Blank Summary

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6817-MB	3A158439.D	1	12/06/17	BM	n/a	n/a	V3A6817

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8 92%	51-175%

Blank Spike Summary

Page 1 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-BS	4D84315.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	20.4	102	70-130
78-93-3	2-Butanone	20	18.3	92	70-130
71-43-2	Benzene	5	4.6	92	70-130
108-86-1	Bromobenzene	5	4.6	92	70-130
74-97-5	Bromochloromethane	5	4.7	94	70-130
75-27-4	Bromodichloromethane	5	5.0	100	70-130
75-25-2	Bromoform	5	5.2	104	70-130
74-83-9	Bromomethane	2	2.9	145* a	70-130
104-51-8	n-Butylbenzene	5	4.6	92	70-130
135-98-8	sec-Butylbenzene	5	4.5	90	70-130
98-06-6	tert-Butylbenzene	5	4.4	88	70-130
75-15-0	Carbon disulfide	5	4.8	96	70-130
108-90-7	Chlorobenzene	5	4.6	92	70-130
75-00-3	Chloroethane	2	2.0	100	70-130
67-66-3	Chloroform	5	4.7	94	70-130
74-87-3	Chloromethane	2	2.0	100	70-130
95-49-8	o-Chlorotoluene	5	4.7	94	70-130
106-43-4	p-Chlorotoluene	5	4.6	92	70-130
56-23-5	Carbon tetrachloride	5	4.9	98	70-130
75-34-3	1,1-Dichloroethane	5	4.9	98	70-130
75-35-4	1,1-Dichloroethylene	5	4.8	96	70-130
563-58-6	1,1-Dichloropropene	5	4.6	92	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	5.0	100	70-130
106-93-4	1,2-Dibromoethane	5	4.7	94	70-130
107-06-2	1,2-Dichloroethane	5	5.0	100	70-130
78-87-5	1,2-Dichloropropane	5	4.8	96	70-130
142-28-9	1,3-Dichloropropane	5	4.6	92	70-130
594-20-7	2,2-Dichloropropane	5	5.0	100	70-130
124-48-1	Dibromochloromethane	5	5.0	100	70-130
74-95-3	Dibromomethane	5	4.9	98	70-130
75-71-8	Dichlorodifluoromethane	2	2.1	105	70-130
541-73-1	m-Dichlorobenzene	5	4.8	96	70-130
95-50-1	o-Dichlorobenzene	5	4.8	96	70-130
106-46-7	p-Dichlorobenzene	5	4.7	94	70-130
156-60-5	trans-1,2-Dichloroethylene	5	4.8	96	70-130
156-59-2	cis-1,2-Dichloroethylene	5	4.6	92	70-130

* = Outside of Control Limits.

5.2.1
5

Blank Spike Summary

Page 2 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-BS	4D84315.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	4.5	90	70-130
10061-02-6	trans-1,3-Dichloropropene	5	4.7	94	70-130
100-41-4	Ethylbenzene	5	4.5	90	70-130
87-68-3	Hexachlorobutadiene	5	4.7	94	70-130
591-78-6	2-Hexanone	20	18.8	94	70-130
98-82-8	Isopropylbenzene	5	4.5	90	70-130
99-87-6	p-Isopropyltoluene	5	4.4	88	70-130
75-09-2	Methylene chloride	5	4.5	90	70-130
1634-04-4	Methyl Tert Butyl Ether	10	9.0	90	70-130
108-10-1	4-Methyl-2-pentanone	20	19.0	95	70-130
91-20-3	Naphthalene	5	4.5	90	70-130
103-65-1	n-Propylbenzene	5	4.6	92	70-130
100-42-5	Styrene	5	4.4	88	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	4.9	98	70-130
71-55-6	1,1,1-Trichloroethane	5	5.0	100	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	5.0	100	70-130
79-00-5	1,1,2-Trichloroethane	5	4.9	98	70-130
87-61-6	1,2,3-Trichlorobenzene	5	4.8	96	70-130
96-18-4	1,2,3-Trichloropropane	5	5.3	106	70-130
120-82-1	1,2,4-Trichlorobenzene	5	4.7	94	70-130
95-63-6	1,2,4-Trimethylbenzene	5	4.5	90	70-130
108-67-8	1,3,5-Trimethylbenzene	5	4.5	90	70-130
127-18-4	Tetrachloroethylene	5	4.8	96	70-130
108-88-3	Toluene	5	4.5	90	70-130
79-01-6	Trichloroethylene	5	4.7	94	70-130
75-69-4	Trichlorofluoromethane	2	2.1	105	70-130
75-01-4	Vinyl chloride	2	1.9	95	70-130
	m,p-Xylene	10	9.0	90	70-130
95-47-6	o-Xylene	5	4.5	90	70-130
1330-20-7	Xylenes (total)	15	13.5	90	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	108%	70-130%
460-00-4	4-Bromofluorobenzene	103%	70-130%

* = Outside of Control Limits.

5.2.1
5

Blank Spike Summary

Page 3 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D3636-BS	4D84315.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

(a) High percent recoveries and no associated positive reported in the QC batch.

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Page 1 of 1

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6817-BS	3A158440.D	1	12/06/17	BM	n/a	n/a	V3A6817
V3A6817-BSD	3A158441.D	1	12/06/17	BM	n/a	n/a	V3A6817

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
123-91-1	1,4-Dioxane	20	17.1	86	18.9	95	10	58-138/20

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
17647-74-4	1,4-Dioxane-d8	94%	105%	51-175%

* = Outside of Control Limits.

5.3.1
5

Matrix Spike Summary

Page 1 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56003-1MS	4D84324A.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56003-1	4D84316.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	JC56003-1		Spike	MS	MS	Limits
		ug/l	Q	ug/l	ug/l	%	
67-64-1	Acetone	ND	20	22.7	114	41-142	
78-93-3	2-Butanone	ND	20	22.8	114	55-129	
71-43-2	Benzene	ND	5	5.1	102	53-138	
108-86-1	Bromobenzene	ND	5	5.8	116	54-138	
74-97-5	Bromochloromethane	ND	5	5.4	108	55-140	
75-27-4	Bromodichloromethane	ND	5	6.0	120	57-147	
75-25-2	Bromoform	ND	5	6.5	130	47-137	
74-83-9	Bromomethane	ND	2	3.0	150	40-162	
104-51-8	n-Butylbenzene	ND	5	5.7	114	45-144	
135-98-8	sec-Butylbenzene	ND	5	5.5	110	46-145	
98-06-6	tert-Butylbenzene	ND	5	5.2	104	48-141	
75-15-0	Carbon disulfide	ND	5	5.5	110	35-127	
108-90-7	Chlorobenzene	ND	5	5.5	110	54-135	
75-00-3	Chloroethane	ND	2	2.6	130	38-153	
67-66-3	Chloroform	1.0	5	6.5	110	57-151	
74-87-3	Chloromethane	ND	2	2.7	135	39-165	
95-49-8	o-Chlorotoluene	ND	5	5.6	112	55-142	
106-43-4	p-Chlorotoluene	ND	5	5.5	110	55-139	
56-23-5	Carbon tetrachloride	ND	5	5.4	108	49-170	
75-34-3	1,1-Dichloroethane	ND	5	5.3	106	55-149	
75-35-4	1,1-Dichloroethylene	ND	5	5.3	106	42-142	
563-58-6	1,1-Dichloropropene	ND	5	5.0	100	46-151	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5	7.1	142* a	48-141	
106-93-4	1,2-Dibromoethane	ND	5	5.7	114	57-135	
107-06-2	1,2-Dichloroethane	ND	5	6.0	120	59-166	
78-87-5	1,2-Dichloropropane	ND	5	5.6	112	53-142	
142-28-9	1,3-Dichloropropane	ND	5	5.9	118	58-143	
594-20-7	2,2-Dichloropropane	ND	5	5.7	114	38-165	
124-48-1	Dibromochloromethane	ND	5	6.2	124	55-138	
74-95-3	Dibromomethane	ND	5	5.9	118	61-144	
75-71-8	Dichlorodifluoromethane	ND	2	2.9	145	23-172	
541-73-1	m-Dichlorobenzene	ND	5	5.8	116	53-138	
95-50-1	o-Dichlorobenzene	ND	5	6.1	122	54-140	
106-46-7	p-Dichlorobenzene	ND	5	5.9	118	53-137	
156-60-5	trans-1,2-Dichloroethylene	ND	5	5.4	108	47-148	
156-59-2	cis-1,2-Dichloroethylene	ND	5	5.1	102	51-146	

* = Outside of Control Limits.

5.4.1
5

Matrix Spike Summary

Page 2 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56003-1MS	4D84324A.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56003-1	4D84316.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	JC56003-1 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	5.2	104	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	5.6	112	54-142
100-41-4	Ethylbenzene	ND	5	5.3	106	51-138
87-68-3	Hexachlorobutadiene	ND	5	6.2	124	40-154
591-78-6	2-Hexanone	ND	20	26.1	131* a	53-128
98-82-8	Isopropylbenzene	ND	5	5.3	106	49-139
99-87-6	p-Isopropyltoluene	ND	5	5.4	108	45-141
75-09-2	Methylene chloride	ND	5	5.0	100	54-137
1634-04-4	Methyl Tert Butyl Ether	0.34	J	10	10.3	100
108-10-1	4-Methyl-2-pentanone	ND	20	25.3	127	58-127
91-20-3	Naphthalene	ND	5	6.2	124	44-140
103-65-1	n-Propylbenzene	ND	5	5.5	110	50-142
100-42-5	Styrene	ND	5	5.3	106	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	5.9	118	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	5.3	106	52-164
79-34-5	1,1,2,2-Tetrachloroethane	ND	5	6.8	136	58-138
79-00-5	1,1,2-Trichloroethane	ND	5	6.0	120	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	6.2	124	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	6.7	134	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	6.1	122	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	5.5	110	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	5.5	110	45-138
127-18-4	Tetrachloroethylene	ND	5	5.5	110	45-145
108-88-3	Toluene	ND	5	5.0	100	52-134
79-01-6	Trichloroethylene	ND	5	5.2	104	54-143
75-69-4	Trichlorofluoromethane	ND	2	3.0	150	36-167
75-01-4	Vinyl chloride	ND	2	2.6	130	35-162
	m,p-Xylene	ND	10	10.7	107	49-135
95-47-6	o-Xylene	ND	5	5.4	108	49-134
1330-20-7	Xylenes (total)	ND	15	16.1	107	50-134

CAS No.	Surrogate Recoveries	MS	JC56003-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	107%	101%	70-130%
460-00-4	4-Bromofluorobenzene	101%	96%	70-130%

* = Outside of Control Limits.

5.4.1
5

Matrix Spike Summary

Page 3 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56003-1MS	4D84324A.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56003-1	4D84316.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

(a) Outside in house control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JC56376

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56363-1MS	3A158451.D	1	12/06/17	BM	n/a	n/a	V3A6817
JC56363-1MSD	3A158452.D	1	12/06/17	BM	n/a	n/a	V3A6817
JC56363-1 ^a	3A158445.D	1	12/06/17	BM	n/a	n/a	V3A6817

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	JC56363-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	8.1		20	24.9	84	20	27.3	96	9	36-166/26
CAS No. Surrogate Recoveries MS MSD JC56363-1 Limits											
17647-74-4	1,4-Dioxane-d8			104%	105%	105%		51-175%			

(a) Lab is certified for all SW846 8260 work in California, including SIM work. The cert exceptions listed for this compound do not impact regulatory use of this data in California (MDL reporting).

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56376-2DUP	4D84324.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56376-2 ^a	4D84321.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	JC56376-2		Q	RPD	Limits
		ug/l	DUP ug/l			
67-64-1	Acetone	ND	ND	nc	10	
78-93-3	2-Butanone	ND	ND	nc	12	
71-43-2	Benzene	ND	ND	nc	10	
108-86-1	Bromobenzene	ND	ND	nc	10	
74-97-5	Bromochloromethane	ND	ND	nc	10	
75-27-4	Bromodichloromethane	ND	ND	nc	10	
75-25-2	Bromoform	ND	ND	nc	10	
74-83-9	Bromomethane	ND	ND	nc	10	
104-51-8	n-Butylbenzene	ND	ND	nc	10	
135-98-8	sec-Butylbenzene	ND	ND	nc	10	
98-06-6	tert-Butylbenzene	ND	ND	nc	10	
75-15-0	Carbon disulfide	ND	ND	nc	19	
108-90-7	Chlorobenzene	ND	ND	nc	10	
75-00-3	Chloroethane	ND	ND	nc	10	
67-66-3	Chloroform	ND	ND	nc	12	
74-87-3	Chloromethane	ND	ND	nc	10	
95-49-8	o-Chlorotoluene	ND	ND	nc	10	
106-43-4	p-Chlorotoluene	ND	ND	nc	10	
56-23-5	Carbon tetrachloride	ND	ND	nc	10	
75-34-3	1,1-Dichloroethane	0.17	J 0.16	J	6	10
75-35-4	1,1-Dichloroethylene	1.9	1.7		11* ^b	10
563-58-6	1,1-Dichloropropene	ND	ND	nc	10	
96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	nc	10	
106-93-4	1,2-Dibromoethane	ND	ND	nc	10	
107-06-2	1,2-Dichloroethane	ND	ND	nc	10	
78-87-5	1,2-Dichloropropane	ND	ND	nc	10	
142-28-9	1,3-Dichloropropane	ND	ND	nc	10	
594-20-7	2,2-Dichloropropane	ND	ND	nc	10	
124-48-1	Dibromochloromethane	ND	ND	nc	10	
74-95-3	Dibromomethane	ND	ND	nc	10	
75-71-8	Dichlorodifluoromethane	ND	ND	nc	10	
541-73-1	m-Dichlorobenzene	ND	ND	nc	10	
95-50-1	o-Dichlorobenzene	ND	ND	nc	10	
106-46-7	p-Dichlorobenzene	ND	ND	nc	10	
156-60-5	trans-1,2-Dichloroethylene	ND	ND	nc	10	
156-59-2	cis-1,2-Dichloroethylene	ND	ND	nc	10	

* = Outside of Control Limits.

5.6.1
5

Duplicate Summary

Page 2 of 3

Job Number: JC56376
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56376-2DUP	4D84324.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56376-2 ^a	4D84321.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

CAS No.	Compound	JC56376-2		Q	RPD	Limits	
		ug/l	ug/l				
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10		
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10		
100-41-4	Ethylbenzene	ND	ND	nc	10		
87-68-3	Hexachlorobutadiene	ND	ND	nc	10		
591-78-6	2-Hexanone	ND	ND	nc	10		
98-82-8	Isopropylbenzene	ND	ND	nc	10		
99-87-6	p-Isopropyltoluene	ND	ND	nc	10		
75-09-2	Methylene chloride	ND	ND	nc	10		
1634-04-4	Methyl Tert Butyl Ether	ND	ND	nc	10		
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10		
91-20-3	Naphthalene	ND	ND	nc	10		
103-65-1	n-Propylbenzene	ND	ND	nc	10		
100-42-5	Styrene	ND	ND	nc	10		
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10		
71-55-6	1,1,1-Trichloroethane	0.34	J	0.32	J	6	10
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10		
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10		
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10		
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10		
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10		
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10		
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10		
127-18-4	Tetrachloroethylene	ND	ND	nc	10		
108-88-3	Toluene	ND	ND	nc	10		
79-01-6	Trichloroethylene	ND	ND	nc	10		
75-69-4	Trichlorofluoromethane	ND	ND	nc	10		
75-01-4	Vinyl chloride	ND	ND	nc	10		
	m,p-Xylene	ND	ND	nc	10		
95-47-6	o-Xylene	ND	ND	nc	10		
1330-20-7	Xylenes (total)	ND	ND	nc	10		

CAS No.	Surrogate Recoveries	DUP	JC56376-2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	99%	101%	70-130%
460-00-4	4-Bromofluorobenzene	95%	95%	70-130%

* = Outside of Control Limits.

5.6.1
5

Duplicate Summary

Page 3 of 3

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC56376-2DUP	4D84324.D	1	12/04/17	RS	n/a	n/a	V4D3636
JC56376-2 ^a	4D84321.D	1	12/04/17	RS	n/a	n/a	V4D3636

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC56376-1, JC56376-2, JC56376-3

(a) EPA 524.2 is not a certified method for non-potable water samples.

(b) Analytical precision exceeds in-house control limits.

* = Outside of Control Limits.

5.6.1
5

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample: V3A6816-BFB
Lab File ID: 3A158421.D
Instrument ID: GCMS3A

Injection Date: 12/05/17
Injection Time: 16:08

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	5563	18.0	Pass
75	30.0 - 60.0% of mass 95	13825	44.8	Pass
95	Base peak, 100% relative abundance	30872	100.0	Pass
96	5.0 - 9.0% of mass 95	2264	7.33	Pass
173	Less than 2.0% of mass 174	119	0.39	(0.43) ^a Pass
174	50.0 - 120.0% of mass 95	27528	89.2	Pass
175	5.0 - 9.0% of mass 174	2211	7.16	(8.03) ^a Pass
176	95.0 - 101.0% of mass 174	26752	86.7	(97.2) ^a Pass
177	5.0 - 9.0% of mass 176	1714	5.55	(6.41) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6816-IC6816	3A158422.D	12/05/17	16:36	00:28	Initial cal 0.25
V3A6816-IC6816	3A158423.D	12/05/17	17:02	00:54	Initial cal 0.4
V3A6816-IC6816	3A158424.D	12/05/17	17:28	01:20	Initial cal 1
V3A6816-IC6816	3A158425.D	12/05/17	17:54	01:46	Initial cal 2
V3A6816-IC6816	3A158426.D	12/05/17	18:20	02:12	Initial cal 5
V3A6816-ICC6816	3A158427.D	12/05/17	18:46	02:38	Initial cal 20
V3A6816-IC6816	3A158428.D	12/05/17	19:11	03:03	Initial cal 50
V3A6816-IC6816	3A158429.D	12/05/17	19:37	03:29	Initial cal 100
V3A6816-IC6816	3A158430.D	12/05/17	20:03	03:55	Initial cal 200
V3A6816-ICV6816	3A158433.D	12/05/17	21:21	05:13	Initial cal verification 20

Instrument Performance Check (BFB)

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6817-BFB	Injection Date:	12/06/17
Lab File ID:	3A158436.D	Injection Time:	08:43
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	5183	17.0	Pass
75	30.0 - 60.0% of mass 95	13363	43.8	Pass
95	Base peak, 100% relative abundance	30517	100.0	Pass
96	5.0 - 9.0% of mass 95	1701	5.57	Pass
173	Less than 2.0% of mass 174	158	0.52	(0.58) ^a Pass
174	50.0 - 120.0% of mass 95	27024	88.6	Pass
175	5.0 - 9.0% of mass 174	2062	6.76	(7.63) ^a Pass
176	95.0 - 101.0% of mass 174	25898	84.9	(95.8) ^a Pass
177	5.0 - 9.0% of mass 176	1866	6.11	(7.21) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6817-CC6816	3A158437.D	12/06/17	09:18	00:35	Continuing cal 20
V3A6817-MB	3A158439.D	12/06/17	10:28	01:45	Method Blank
V3A6817-BS	3A158440.D	12/06/17	11:03	02:20	Blank Spike
V3A6817-BSD	3A158441.D	12/06/17	11:29	02:46	Blank Spike Duplicate
ZZZZZZ	3A158443.D	12/06/17	12:20	03:37	(unrelated sample)
ZZZZZZ	3A158444.D	12/06/17	12:46	04:03	(unrelated sample)
JC56363-1	3A158445.D	12/06/17	13:12	04:29	(used for QC only; not part of job JC56376)
ZZZZZZ	3A158446.D	12/06/17	13:38	04:55	(unrelated sample)
ZZZZZZ	3A158447.D	12/06/17	14:03	05:20	(unrelated sample)
ZZZZZZ	3A158449.D	12/06/17	14:55	06:12	(unrelated sample)
ZZZZZZ	3A158450.D	12/06/17	15:21	06:38	(unrelated sample)
JC56363-1MS	3A158451.D	12/06/17	15:46	07:03	Matrix Spike
JC56363-1MSD	3A158452.D	12/06/17	16:12	07:29	Matrix Spike Duplicate
ZZZZZZ	3A158454.D	12/06/17	17:04	08:21	(unrelated sample)
ZZZZZZ	3A158455.D	12/06/17	17:30	08:47	(unrelated sample)
ZZZZZZ	3A158456.D	12/06/17	17:56	09:13	(unrelated sample)
ZZZZZZ	3A158457.D	12/06/17	18:21	09:38	(unrelated sample)
JC56376-1	3A158458.D	12/06/17	18:47	10:04	RW-12270CM-113017
JC56376-2	3A158459.D	12/06/17	19:13	10:30	RW-12270CM-113017-F
JC56376-3	3A158460.D	12/06/17	19:39	10:56	TB-113017

Instrument Performance Check (BFB)

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V4D3632-BFB	Injection Date:	11/30/17
Lab File ID:	4D84242.D	Injection Time:	16:55
Instrument ID:	GCMS4D		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	2375	17.0	Pass
75	30.0 - 80.0% of mass 95	6263	44.7	Pass
95	Base peak, 100% relative abundance	14001	100.0	Pass
96	5.0 - 9.0% of mass 95	910	6.50	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	12736	91.0	Pass
175	5.0 - 9.0% of mass 174	1040	7.43	(8.17) ^a Pass
176	95.01 - 101.0% of mass 174	12226	87.3	(96.0) ^a Pass
177	5.0 - 9.0% of mass 176	753	5.38	(6.16) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V4D3632-IC3632	4D84243.D	11/30/17	17:33	00:38	Initial cal 0.2
V4D3632-IC3632	4D84244.D	11/30/17	18:05	01:10	Initial cal 0.5
V4D3632-IC3632	4D84245.D	11/30/17	18:37	01:42	Initial cal 1
V4D3632-IC3632	4D84246.D	11/30/17	19:09	02:14	Initial cal 2
V4D3632-IC3632	4D84247.D	11/30/17	19:41	02:46	Initial cal 5
V4D3632-ICC3632	4D84248.D	11/30/17	20:14	03:19	Initial cal 10
V4D3632-IC3632	4D84249.D	11/30/17	20:46	03:51	Initial cal 20
V4D3632-IC3632	4D84250.D	11/30/17	21:18	04:23	Initial cal 40
V4D3632-IC3632	4D84251.D	11/30/17	21:50	04:55	Initial cal 80
V4D3632-ICV3632	4D84254.D	11/30/17	23:26	06:31	Initial cal verification 10

Instrument Performance Check (BFB)

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V4D3633-BFB	Injection Date:	12/01/17
Lab File ID:	4D84257.D	Injection Time:	09:48
Instrument ID:	GCMS4D		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	3067	17.2	Pass
75	30.0 - 80.0% of mass 95	8414	47.2	Pass
95	Base peak, 100% relative abundance	17824	100.0	Pass
96	5.0 - 9.0% of mass 95	1274	7.15	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	15779	88.5	Pass
175	5.0 - 9.0% of mass 174	1254	7.04	(7.95) ^a Pass
176	95.01 - 101.0% of mass 174	15527	87.1	(98.4) ^a Pass
177	5.0 - 9.0% of mass 176	937	5.26	(6.03) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V4D3632-ICV3632	4D84261.D	12/01/17	13:24	03:36	Initial cal verification 10
JC55911-2MS	4D84268.D	12/01/17	18:00	08:12	Matrix Spike
JC55911-3DUP	4D84269.D	12/01/17	18:32	08:44	Duplicate
ZZZZZZ	4D84270.D	12/01/17	19:04	09:16	(unrelated sample)
ZZZZZZ	4D84271.D	12/01/17	19:36	09:48	(unrelated sample)
ZZZZZZ	4D84272.D	12/01/17	20:08	10:20	(unrelated sample)
ZZZZZZ	4D84273.D	12/01/17	20:40	10:52	(unrelated sample)
ZZZZZZ	4D84275.D	12/01/17	21:13	11:25	(unrelated sample)
ZZZZZZ	4D84276.D	12/01/17	21:45	11:57	(unrelated sample)

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V4D3636-BFB	Injection Date:	12/04/17
Lab File ID:	4D84312.D	Injection Time:	08:37
Instrument ID:	GCMS4D		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	2606	18.0	Pass
75	30.0 - 80.0% of mass 95	6912	47.9	Pass
95	Base peak, 100% relative abundance	14444	100.0	Pass
96	5.0 - 9.0% of mass 95	1036	7.17	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	12670	87.7	Pass
175	5.0 - 9.0% of mass 174	1059	7.33	(8.36) ^a Pass
176	95.01 - 101.0% of mass 174	12473	86.4	(98.4) ^a Pass
177	5.0 - 9.0% of mass 176	892	6.18	(7.15) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V4D3636-CC3632	4D84313.D	12/04/17	09:19	00:42	Continuing cal 5
V4D3636-MB	4D84314.D	12/04/17	10:05	01:28	Method Blank
V4D3636-BS	4D84315.D	12/04/17	10:37	02:00	Blank Spike
JC56003-1	4D84316.D	12/04/17	11:17	02:40	(used for QC only; not part of job JC56376)
ZZZZZZ	4D84317.D	12/04/17	11:49	03:12	(unrelated sample)
ZZZZZZ	4D84318.D	12/04/17	12:21	03:44	(unrelated sample)
ZZZZZZ	4D84319.D	12/04/17	12:53	04:16	(unrelated sample)
JC56376-1	4D84320.D	12/04/17	13:25	04:48	RW-12270CM-113017
JC56376-2	4D84321.D	12/04/17	13:58	05:21	RW-12270CM-113017-F
JC56376-3	4D84322.D	12/04/17	14:30	05:53	TB-113017
JC56376-2DUP	4D84324.D	12/04/17	15:34	06:57	Duplicate
JC56003-1MS	4D84324A.D	12/04/17	16:06	07:29	Matrix Spike
ZZZZZZ	4D84325.D	12/04/17	16:38	08:01	(unrelated sample)
ZZZZZZ	4D84326.D	12/04/17	17:10	08:33	(unrelated sample)
ZZZZZZ	4D84327.D	12/04/17	17:42	09:05	(unrelated sample)
ZZZZZZ	4D84328.D	12/04/17	18:14	09:37	(unrelated sample)
ZZZZZZ	4D84329.D	12/04/17	18:46	10:09	(unrelated sample)
ZZZZZZ	4D84330.D	12/04/17	19:18	10:41	(unrelated sample)
ZZZZZZ	4D84331.D	12/04/17	19:51	11:14	(unrelated sample)
ZZZZZZ	4D84332.D	12/04/17	20:23	11:46	(unrelated sample)

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC56376-1	4D84320.D	99	95
JC56376-2	4D84321.D	101	95
JC56376-3	4D84322.D	99	93
JC56003-1MS	4D84324A.D	107	101
JC56376-2DUP	4D84324.D	99	95
V4D3636-BS	4D84315.D	108	103
V4D3636-MB	4D84314.D	101	99

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = 1,2-Dichlorobenzene-d4	70-130%
S2 = 4-Bromofluorobenzene	70-130%

5.8.1
5

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC56376

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC56376-1	3A158458.D	105
JC56376-2	3A158459.D	108
JC56376-3	3A158460.D	117
JC56363-1MS	3A158451.D	104
JC56363-1MSD	3A158452.D	105
V3A6817-BS	3A158440.D	94
V3A6817-BSD	3A158441.D	105
V3A6817-MB	3A158439.D	92

Surrogate
Compounds

Recovery
Limits

S1 = 1,4-Dioxane-d8

51-175%

5.8.2
5

The results set forth herein are provided by SGS North America Inc.

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Automated Report

Technical Report for

WSP Environment & Energy

Kop-Flex, Hanover, VA

31400390-09

SGS Job Number: JC57521

Sampling Date: 12/15/17



Report to:

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Total number of pages in report: 40



Test results contained within this data package meet the requirements
of the National Environmental Laboratory Accreditation Program
and/or state specific certification programs as applicable.

Nancy Cole
Laboratory Director

Client Service contact: Rocus Peters 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC,
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Test results relate only to samples analyzed.

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Sample Summary

WSP Environment & Energy

Job No: JC57521

Kop-Flex, Hanover, VA
Project No: 31400390-09

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
JC57521-1	12/15/17	10:35 MK	12/16/17	AQ	Ground Water
JC57521-2	12/15/17	10:40 MK	12/16/17	AQ	Ground Water
JC57521-3	12/15/17	10:40 MK	12/16/17	AQ	Trip Blank Water



Summary of Hits

Job Number: JC57521
 Account: WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA
 Collected: 12/15/17

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC57521-1	RW-1227OCM-121517					
1,1-Dichloroethylene ^a	7.0	0.50	0.23	ug/l	EPA 524.2 REV 4.1	
1,1,1-Trichloroethane ^a	0.36 J	0.50	0.12	ug/l	EPA 524.2 REV 4.1	
1,4-Dioxane	2.0	0.40	0.29	ug/l	SW846 8260C BY SIM	
JC57521-2	RW-1227OCM-121517-F					
1,1-Dichloroethylene ^a	2.8	0.50	0.23	ug/l	EPA 524.2 REV 4.1	
1,1,1-Trichloroethane ^a	0.39 J	0.50	0.12	ug/l	EPA 524.2 REV 4.1	
1,4-Dioxane	2.1	0.40	0.29	ug/l	SW846 8260C BY SIM	
JC57521-3	TB-121517					

No hits reported in this sample.

(a) EPA 524.2 is not a certified method for non-potable water samples.

Sample Results

Report of Analysis

Report of Analysis

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Client Sample ID: RW-1227OCM-121517

Lab Sample ID: JC57521-1

Date Sampled: 12/15/17

Matrix: AQ - Ground Water

Date Received: 12/16/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	1B113075.D	1	12/19/17 22:35	BK	n/a	n/a	V1B5401

Purge Volume

Run #1 5.0 ml

Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	7.0	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

3-1
3

Client Sample ID: RW-1227OCM-121517
 Lab Sample ID: JC57521-1
 Matrix: AQ - Ground Water
 Method: EPA 524.2 REV 4.1
 Project: Kop-Flex, Hanover, VA

Date Sampled: 12/15/17
 Date Received: 12/16/17
 Percent Solids: n/a

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.36	0.50	0.12	ug/l	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	86%		70-130%
460-00-4	4-Bromofluorobenzene	79%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3.1

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Client Sample ID:	RW-1227OCM-121517	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-1	Date Received:	12/16/17
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: RW-1227OCM-121517

Lab Sample ID: JC57521-1

Date Sampled: 12/15/17

Matrix: AQ - Ground Water

Date Received: 12/16/17

Method: SW846 8260C BY SIM

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158592.D	1	12/19/17 17:42	BM	n/a	n/a	V3A6822
Run #2							

Purge Volume

Run #1 5.0 ml

Run #2

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

123-91-1	1,4-Dioxane	2.0	0.40	0.29	ug/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
---------	----------------------	--------	--------	--------

17647-74-4	1,4-Dioxane-d8	97%		51-175%
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ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1227OCM-121517-F	Date Sampled:	12/15/17				
Lab Sample ID:	JC57521-2	Date Received:	12/16/17				
Matrix:	AQ - Ground Water	Percent Solids:	n/a				
Method:	EPA 524.2 REV 4.1						
Project:	Kop-Flex, Hanover, VA						
Run #1 ^a	File ID 1B113076.D	DF 1	Analyzed 12/19/17 23:07	By BK	Prep Date n/a	Prep Batch n/a	Analytical Batch V1B5401
Run #2							
	Purge Volume						
Run #1	5.0 ml						
Run #2							

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	2.8	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: RW-1227OCM-121517-F

Lab Sample ID: JC57521-2

Date Sampled: 12/15/17

Matrix: AQ - Ground Water

Date Received: 12/16/17

Method: EPA 524.2 REV 4.1

Percent Solids: n/a

Project: Kop-Flex, Hanover, VA

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	0.39	0.50	0.12	ug/l	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	88%		70-130%
460-00-4	4-Bromofluorobenzene	85%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1227OCM-121517-F	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-2	Date Received:	12/16/17
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	RW-1227OCM-121517-F	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-2	Date Received:	12/16/17
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158593.D	1	12/19/17 18:08	BM	n/a	n/a	V3A6822
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	2.1	0.40	0.29	ug/l	
CAS No. Surrogate Recoveries Run# 1 Run# 2 Limits						
17647-74-4	1,4-Dioxane-d8	94%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-121517	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-3	Date Received:	12/16/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

Run #1 ^a	File ID 1B113077.D	DF 1	Analyzed 12/19/17 23:39	By BK	Prep Date n/a	Prep Batch n/a	Analytical Batch V1B5401
Run #2							

Purge Volume
Run #1 5.0 ml
Run #2

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB-121517	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-3	Date Received:	12/16/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	98%		70-130%
460-00-4	4-Bromofluorobenzene	85%		70-130%

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3.3
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Client Sample ID:	TB-121517	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-3	Date Received:	12/16/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 524.2 REV 4.1		
Project:	Kop-Flex, Hanover, VA		

VOA List

CAS No.	Compound	Result	RL	MDL	Units	Q
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(a) EPA 524.2 is not a certified method for non-potable water samples.

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

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3

Client Sample ID:	TB-121517	Date Sampled:	12/15/17
Lab Sample ID:	JC57521-3	Date Received:	12/16/17
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260C BY SIM		
Project:	Kop-Flex, Hanover, VA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3A158594.D	1	12/19/17 18:34	BM	n/a	n/a	V3A6822
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	
Surrogate Recoveries						
17647-74-4	1,4-Dioxane-d8	91%			51-175%	

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

GW WTB

CHAIN-OF-CUSTODY RECORD

JC57521

Page 1 of 1

WSP USA Office Address 13535 Dulles Technology Drive #3000 Herndon VA		Requested Analyses & Preservatives					
Project Name hypHEx	WSP USA Contact Name Eric Johnson	No. 008203 WSP					
Project Location Anacostia MD	WSP USA Contact E-mail eric.johnson@wsp.com	Laboratory Name & Location SGS Accutest					
Project Number & Task 31400390 - 09	WSP USA Contact Phone (703) 727-6500	Laboratory Project Manager Roxie Peters					
Sampler(s) Name(s) John Langham	Sampler(s) Signature(s) JL	Number of Containers	VOCs (8260)	<input checked="" type="checkbox"/>	Dioxane (8260 S/N)	<input type="checkbox"/>	<input type="checkbox"/>
Sample Identification	Matrix		Collection Start* Date 12/15/17	Collection Stop* Time 1035	8+X	6+X	4+X
1 RW-12270CM-121517 A							
2 RW-12270CM-121517 B							
3 T8-121517 F							
<i>N513</i>							
<i>RECEIVED</i>							
<i>INITIAL ASSESSMENT GFA</i>							
<i>LABEL VERIFICATION</i>							
Relinquished By (Signature) MVR	Date 12/15/17	Time 1600	Received By (Signature) Fedex	Date	Time	Shipment Method	Tracking Number(s) 8099 7536 8470
Relinquished By (Signature) JK	Date 12/16	Time 11:00	Received By (Signature) JK	Date	Time	Number of Packages	Custody Seal Number(s)

*Use stop time/date for composite and/or air samples, use only start time/date for all other samples.

Matrix: AQ = Aqueous, S = Soil, SE = Sediment, A = Air, W = Wipe, B = Bulk, O = Other (detail in comments)

2/10/18

JC57521: Chain of Custody

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SGS Sample Receipt Summary

Job Number: JC57521 Client: _____ Project: _____
 Date / Time Received: 12/16/2017 11:00:00 AM Delivery Method: _____ Airbill #'s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);

Cooler Temps (Corrected) °C: Cooler 1: (3.0);

Cooler Security	Y or N	Y or N	Sample Integrity - Documentation	Y or N
1. Custody Seals Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/> <input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
Cooler Temperature		Y or N	Sample Integrity - Condition	
1. Temp criteria achieved:	<input checked="" type="checkbox"/> <input type="checkbox"/>		1. Sample rcvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Cooler temp verification:	IR Gun		2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Cooler media:	Ice (Bag)		3. Condition of sample:	Intact
4. No. Coolers:	1			
Quality Control Preservation		Y or N	Sample Integrity - Instructions	Y or N
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		1. Analysis requested is clear:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		2. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/> <input type="checkbox"/>		3. Sufficient volume rcvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>
4. VOCs headspace free:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		4. Compositing instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
		N/A	5. Filtering instructions clear:	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

Test Strip Lot #: pH 1-12: 216017 pH 12+: 208717 Other: (Specify) _____

Comments

SM089-03
Rev. Date 12/7/17

JC57521: Chain of Custody

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MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Surrogate Recovery Summaries

Method Blank Summary

Page 1 of 3

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5401-MB	1B113058.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.8	ug/l	
78-93-3	2-Butanone	ND	5.0	2.5	ug/l	
71-43-2	Benzene	ND	0.50	0.26	ug/l	
108-86-1	Bromobenzene	ND	0.50	0.25	ug/l	
74-97-5	Bromochloromethane	ND	0.50	0.42	ug/l	
75-27-4	Bromodichloromethane	ND	0.50	0.36	ug/l	
75-25-2	Bromoform	ND	0.50	0.40	ug/l	
74-83-9	Bromomethane	ND	0.50	0.081	ug/l	
104-51-8	n-Butylbenzene	ND	0.50	0.22	ug/l	
135-98-8	sec-Butylbenzene	ND	0.50	0.26	ug/l	
98-06-6	tert-Butylbenzene	ND	0.50	0.25	ug/l	
75-15-0	Carbon disulfide	ND	0.50	0.39	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.27	ug/l	
75-00-3	Chloroethane	ND	0.50	0.071	ug/l	
67-66-3	Chloroform	ND	0.50	0.33	ug/l	
74-87-3	Chloromethane	ND	0.50	0.39	ug/l	
95-49-8	o-Chlorotoluene	ND	0.50	0.30	ug/l	
106-43-4	p-Chlorotoluene	ND	0.50	0.27	ug/l	
56-23-5	Carbon tetrachloride	ND	0.50	0.13	ug/l	
75-34-3	1,1-Dichloroethane	ND	0.50	0.13	ug/l	
75-35-4	1,1-Dichloroethylene	ND	0.50	0.23	ug/l	
563-58-6	1,1-Dichloropropene	ND	0.50	0.21	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1.0	0.25	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.50	0.29	ug/l	
107-06-2	1,2-Dichloroethane	ND	0.50	0.28	ug/l	
78-87-5	1,2-Dichloropropane	ND	0.50	0.29	ug/l	
142-28-9	1,3-Dichloropropane	ND	0.50	0.24	ug/l	
594-20-7	2,2-Dichloropropane	ND	0.50	0.24	ug/l	
124-48-1	Dibromochloromethane	ND	0.50	0.094	ug/l	
74-95-3	Dibromomethane	ND	0.50	0.085	ug/l	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.44	ug/l	
541-73-1	m-Dichlorobenzene	ND	0.50	0.28	ug/l	
95-50-1	o-Dichlorobenzene	ND	0.50	0.26	ug/l	
106-46-7	p-Dichlorobenzene	ND	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	0.50	0.098	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	0.50	0.26	ug/l	

5.1.1
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Method Blank Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5401-MB	1B113058.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.14	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.26	ug/l	
87-68-3	Hexachlorobutadiene	ND	0.50	0.32	ug/l	
591-78-6	2-Hexanone	ND	2.0	1.3	ug/l	
98-82-8	Isopropylbenzene	ND	0.50	0.25	ug/l	
99-87-6	p-Isopropyltoluene	ND	0.50	0.23	ug/l	
75-09-2	Methylene chloride	ND	0.50	0.37	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.080	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	2.0	1.5	ug/l	
91-20-3	Naphthalene	ND	0.50	0.18	ug/l	
103-65-1	n-Propylbenzene	ND	0.50	0.26	ug/l	
100-42-5	Styrene	ND	0.50	0.21	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.50	0.13	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.12	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.099	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.12	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	0.50	0.11	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	0.50	0.26	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	0.14	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	0.24	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	0.24	ug/l	
127-18-4	Tetrachloroethylene	ND	0.50	0.12	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
79-01-6	Trichloroethylene	ND	0.50	0.11	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.48	ug/l	
75-01-4	Vinyl chloride	ND	0.50	0.056	ug/l	
	m,p-Xylene	ND	0.50	0.26	ug/l	
95-47-6	o-Xylene	ND	0.50	0.24	ug/l	
1330-20-7	Xylenes (total)	ND	0.50	0.24	ug/l	

CAS No.	Surrogate Recoveries	Limits
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2199-69-1	1,2-Dichlorobenzene-d4	90%	70-130%
460-00-4	4-Bromofluorobenzene	86%	70-130%

5.1.1
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Method Blank Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5401-MB	1B113058.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method:

JC57521-1, JC57521-2, JC57521-3

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

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Method Blank Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6822-MB	3A158577.D	1	12/19/17	BM	n/a	n/a	V3A6822

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.40	0.29	ug/l	

CAS No.	Surrogate Recoveries	Limits
17647-74-4	1,4-Dioxane-d8	60% 51-175%

Blank Spike Summary

Page 1 of 2

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5401-BS	1B113059.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	20	18.2	91	70-130
78-93-3	2-Butanone	20	20.1	101	70-130
71-43-2	Benzene	5	4.7	94	70-130
108-86-1	Bromobenzene	5	5.0	100	70-130
74-97-5	Bromochloromethane	5	5.1	102	70-130
75-27-4	Bromodichloromethane	5	5.1	102	70-130
75-25-2	Bromoform	5	5.7	114	70-130
74-83-9	Bromomethane	2	1.9	95	70-130
104-51-8	n-Butylbenzene	5	4.3	86	70-130
135-98-8	sec-Butylbenzene	5	4.4	88	70-130
98-06-6	tert-Butylbenzene	5	4.3	86	70-130
75-15-0	Carbon disulfide	5	5.0	100	70-130
108-90-7	Chlorobenzene	5	4.6	92	70-130
75-00-3	Chloroethane	2	1.7	85	70-130
67-66-3	Chloroform	5	5.2	104	70-130
74-87-3	Chloromethane	2	1.8	90	70-130
95-49-8	o-Chlorotoluene	5	4.7	94	70-130
106-43-4	p-Chlorotoluene	5	4.7	94	70-130
56-23-5	Carbon tetrachloride	5	5.3	106	70-130
75-34-3	1,1-Dichloroethane	5	5.3	106	70-130
75-35-4	1,1-Dichloroethylene	5	4.7	94	70-130
563-58-6	1,1-Dichloropropene	5	4.9	98	70-130
96-12-8	1,2-Dibromo-3-chloropropane	5	4.9	98	70-130
106-93-4	1,2-Dibromoethane	5	4.6	92	70-130
107-06-2	1,2-Dichloroethane	5	5.0	100	70-130
78-87-5	1,2-Dichloropropane	5	4.6	92	70-130
142-28-9	1,3-Dichloropropane	5	4.6	92	70-130
594-20-7	2,2-Dichloropropane	5	5.0	100	70-130
124-48-1	Dibromochloromethane	5	5.1	102	70-130
74-95-3	Dibromomethane	5	5.5	110	70-130
75-71-8	Dichlorodifluoromethane	2	1.7	85	70-130
541-73-1	m-Dichlorobenzene	5	5.0	100	70-130
95-50-1	o-Dichlorobenzene	5	4.8	96	70-130
106-46-7	p-Dichlorobenzene	5	5.0	100	70-130
156-60-5	trans-1,2-Dichloroethylene	5	4.6	92	70-130
156-59-2	cis-1,2-Dichloroethylene	5	5.0	100	70-130

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V1B5401-BS	1B113059.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	5	4.7	94	70-130
10061-02-6	trans-1,3-Dichloropropene	5	4.8	96	70-130
100-41-4	Ethylbenzene	5	4.7	94	70-130
87-68-3	Hexachlorobutadiene	5	5.2	104	70-130
591-78-6	2-Hexanone	20	17.7	89	70-130
98-82-8	Isopropylbenzene	5	4.6	92	70-130
99-87-6	p-Isopropyltoluene	5	4.7	94	70-130
75-09-2	Methylene chloride	5	4.7	94	70-130
1634-04-4	Methyl Tert Butyl Ether	5	4.1	82	70-130
108-10-1	4-Methyl-2-pentanone	20	18.4	92	70-130
91-20-3	Naphthalene	5	4.4	88	70-130
103-65-1	n-Propylbenzene	5	4.5	90	70-130
100-42-5	Styrene	5	4.4	88	70-130
630-20-6	1,1,1,2-Tetrachloroethane	5	4.9	98	70-130
71-55-6	1,1,1-Trichloroethane	5	5.0	100	70-130
79-34-5	1,1,2,2-Tetrachloroethane	5	4.3	86	70-130
79-00-5	1,1,2-Trichloroethane	5	4.5	90	70-130
87-61-6	1,2,3-Trichlorobenzene	5	4.8	96	70-130
96-18-4	1,2,3-Trichloropropane	5	4.9	98	70-130
120-82-1	1,2,4-Trichlorobenzene	5	4.9	98	70-130
95-63-6	1,2,4-Trimethylbenzene	5	4.6	92	70-130
108-67-8	1,3,5-Trimethylbenzene	5	4.6	92	70-130
127-18-4	Tetrachloroethylene	5	5.2	104	70-130
108-88-3	Toluene	5	4.6	92	70-130
79-01-6	Trichloroethylene	5	5.1	102	70-130
75-69-4	Trichlorofluoromethane	2	2.1	105	70-130
75-01-4	Vinyl chloride	2	1.8	90	70-130
	m,p-Xylene	10	9.5	95	70-130
95-47-6	o-Xylene	5	4.7	94	70-130
1330-20-7	Xylenes (total)	15	14.2	95	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2199-69-1	1,2-Dichlorobenzene-d4	103%	70-130%
460-00-4	4-Bromofluorobenzene	93%	70-130%

* = Outside of Control Limits.

5.2.1
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Blank Spike Summary

Job Number: JC57521
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3A6822-BS	3A158578.D	1	12/19/17	BM	n/a	n/a	V3A6822

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
123-91-1	1,4-Dioxane	20	15.6	78	58-138

CAS No.	Surrogate Recoveries	BSP	Limits
17647-74-4	1,4-Dioxane-d8	95%	51-175%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC57147-1MS	1B113064.D	1	12/19/17	BK	n/a	n/a	V1B5401
JC57147-1	1B113060.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

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JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	ug/l	JC57147-1 Q	Spike ug/l	MS ug/l	MS %	Limits
67-64-1	Acetone	ND		20	16.2	81	41-142
78-93-3	2-Butanone	ND		20	18.1	91	55-129
71-43-2	Benzene	3.8		5	7.2	68	53-138
108-86-1	Bromobenzene	ND		5	4.1	82	54-138
74-97-5	Bromochloromethane	ND		5	4.2	84	55-140
75-27-4	Bromodichloromethane	ND		5	4.3	86	57-147
75-25-2	Bromoform	ND		5	4.9	98	47-137
74-83-9	Bromomethane	ND		2	2.0	100	40-162
104-51-8	n-Butylbenzene	ND		5	3.9	78	45-144
135-98-8	sec-Butylbenzene	ND		5	4.0	80	46-145
98-06-6	tert-Butylbenzene	ND		5	3.9	78	48-141
75-15-0	Carbon disulfide	ND		5	4.2	84	35-127
108-90-7	Chlorobenzene	ND		5	4.4	88	54-135
75-00-3	Chloroethane	ND		2	1.9	95	38-153
67-66-3	Chloroform	0.91		5	5.2	86	57-151
74-87-3	Chloromethane	ND		2	1.9	95	39-165
95-49-8	o-Chlorotoluene	ND		5	4.3	86	55-142
106-43-4	p-Chlorotoluene	ND		5	4.2	84	55-139
56-23-5	Carbon tetrachloride	0.20	J	5	4.9	94	49-170
75-34-3	1,1-Dichloroethane	0.93		5	5.0	81	55-149
75-35-4	1,1-Dichloroethylene	0.55		5	4.7	83	42-142
563-58-6	1,1-Dichloropropene	ND		5	4.2	84	46-151
96-12-8	1,2-Dibromo-3-chloropropane	ND		5	4.9	98	48-141
106-93-4	1,2-Dibromoethane	ND		5	3.6	72	57-135
107-06-2	1,2-Dichloroethane	1.8		5	5.8	80	59-166
78-87-5	1,2-Dichloropropane	ND		5	3.5	70	53-142
142-28-9	1,3-Dichloropropane	ND		5	4.0	80	58-143
594-20-7	2,2-Dichloropropane	ND		5	4.3	86	38-165
124-48-1	Dibromochloromethane	ND		5	4.6	92	55-138
74-95-3	Dibromomethane	ND		5	4.5	90	61-144
75-71-8	Dichlorodifluoromethane	ND		2	2.1	105	23-172
541-73-1	m-Dichlorobenzene	ND		5	4.4	88	53-138
95-50-1	o-Dichlorobenzene	ND		5	4.6	92	54-140
106-46-7	p-Dichlorobenzene	0.44	J	5	4.7	85	53-137
156-60-5	trans-1,2-Dichloroethylene	ND		5	3.8	76	47-148
156-59-2	cis-1,2-Dichloroethylene	0.41	J	5	4.5	82	51-146

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC57147-1MS	1B113064.D	1	12/19/17	BK	n/a	n/a	V1B5401
JC57147-1	1B113060.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	JC57147-1 ug/l	Spike Q	MS ug/l	MS %	Limits
10061-01-5	cis-1,3-Dichloropropene	ND	5	3.7	74	51-136
10061-02-6	trans-1,3-Dichloropropene	ND	5	3.9	78	54-142
100-41-4	Ethylbenzene	ND	5	4.0	80	51-138
87-68-3	Hexachlorobutadiene	ND	5	5.0	100	40-154
591-78-6	2-Hexanone	ND	20	16.0	80	53-128
98-82-8	Isopropylbenzene	ND	5	4.1	82	49-139
99-87-6	p-Isopropyltoluene	ND	5	4.1	82	45-141
75-09-2	Methylene chloride	1.5	5	5.4	78	54-137
1634-04-4	Methyl Tert Butyl Ether	3.9	5	6.8	58	53-143
108-10-1	4-Methyl-2-pentanone	ND	20	15.2	76	58-127
91-20-3	Naphthalene	ND	5	4.0	80	44-140
103-65-1	n-Propylbenzene	ND	5	4.0	80	50-142
100-42-5	Styrene	ND	5	3.9	78	23-130
630-20-6	1,1,1,2-Tetrachloroethane	ND	5	4.4	88	57-144
71-55-6	1,1,1-Trichloroethane	ND	5	4.3	86	52-164
79-34-5	1,1,2,2-Tetrachloroethane	0.62	5	4.7	82	58-138
79-00-5	1,1,2-Trichloroethane	2.3	5	6.0	74	59-139
87-61-6	1,2,3-Trichlorobenzene	ND	5	4.2	84	47-141
96-18-4	1,2,3-Trichloropropane	ND	5	4.7	94	56-148
120-82-1	1,2,4-Trichlorobenzene	ND	5	4.2	84	46-137
95-63-6	1,2,4-Trimethylbenzene	ND	5	4.1	82	41-138
108-67-8	1,3,5-Trimethylbenzene	ND	5	4.1	82	45-138
127-18-4	Tetrachloroethylene	0.19	J	4.6	88	45-145
108-88-3	Toluene	ND	5	3.9	78	52-134
79-01-6	Trichloroethylene	0.71	5	5.1	88	54-143
75-69-4	Trichlorofluoromethane	ND	2	2.2	110	36-167
75-01-4	Vinyl chloride	ND	2	1.8	90	35-162
	m,p-Xylene	ND	10	8.0	80	49-135
95-47-6	o-Xylene	ND	5	4.2	84	49-134
1330-20-7	Xylenes (total)	ND	15	12.2	81	50-134

CAS No.	Surrogate Recoveries	MS	JC57147-1	Limits
2199-69-1	1,2-Dichlorobenzene-d4	101%	88%	70-130%
460-00-4	4-Bromofluorobenzene	94%	89%	70-130%

* = Outside of Control Limits.

5.3.1
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Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: JC57521

Account: ECSVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC57441-1MS	3A158589.D	1	12/19/17	BM	n/a	n/a	V3A6822
JC57441-1MSD	3A158590.D	1	12/19/17	BM	n/a	n/a	V3A6822
JC57441-1	3A158580.D	1	12/19/17	BM	n/a	n/a	V3A6822

The QC reported here applies to the following samples:

Method: SW846 8260C BY SIM

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	JC57441-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	10.7	20	30.3	98	20	36.4	129	18	36-166/26	

CAS No.	Surrogate Recoveries	MS	MSD	JC57441-1	Limits
17647-74-4	1,4-Dioxane-d8	100%	113%	93%	51-175%

* = Outside of Control Limits.

5.4.1
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Duplicate Summary

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Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC57147-2DUP	1B113065.D	1	12/19/17	BK	n/a	n/a	V1B5401
JC57147-2	1B113061.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	JC57147-2		DUP	Q	RPD	Limits
		ug/l	Q	ug/l			
67-64-1	Acetone	ND		ND	nc		10
78-93-3	2-Butanone	ND		ND	nc		12
71-43-2	Benzene	ND		ND	nc		10
108-86-1	Bromobenzene	ND		ND	nc		10
74-97-5	Bromochloromethane	ND		ND	nc		10
75-27-4	Bromodichloromethane	ND		ND	nc		10
75-25-2	Bromoform	ND		ND	nc		10
74-83-9	Bromomethane	ND		ND	nc		10
104-51-8	n-Butylbenzene	ND		ND	nc		10
135-98-8	sec-Butylbenzene	ND		ND	nc		10
98-06-6	tert-Butylbenzene	ND		ND	nc		10
75-15-0	Carbon disulfide	ND		ND	nc		19
108-90-7	Chlorobenzene	ND		ND	nc		10
75-00-3	Chloroethane	ND		ND	nc		10
67-66-3	Chloroform	ND		ND	nc		12
74-87-3	Chloromethane	ND		ND	nc		10
95-49-8	o-Chlorotoluene	ND		ND	nc		10
106-43-4	p-Chlorotoluene	ND		ND	nc		10
56-23-5	Carbon tetrachloride	ND		ND	nc		10
75-34-3	1,1-Dichloroethane	ND		ND	nc		10
75-35-4	1,1-Dichloroethylene	ND		ND	nc		10
563-58-6	1,1-Dichloropropene	ND		ND	nc		10
96-12-8	1,2-Dibromo-3-chloropropane	ND		ND	nc		10
106-93-4	1,2-Dibromoethane	ND		ND	nc		10
107-06-2	1,2-Dichloroethane	ND		ND	nc		10
78-87-5	1,2-Dichloropropane	ND		ND	nc		10
142-28-9	1,3-Dichloropropane	ND		ND	nc		10
594-20-7	2,2-Dichloropropane	ND		ND	nc		10
124-48-1	Dibromochloromethane	ND		ND	nc		10
74-95-3	Dibromomethane	ND		ND	nc		10
75-71-8	Dichlorodifluoromethane	ND		ND	nc		10
541-73-1	m-Dichlorobenzene	ND		ND	nc		10
95-50-1	o-Dichlorobenzene	ND		ND	nc		10
106-46-7	p-Dichlorobenzene	ND		ND	nc		10
156-60-5	trans-1,2-Dichloroethylene	ND		ND	nc		10
156-59-2	cis-1,2-Dichloroethylene	ND		ND	nc		10

* = Outside of Control Limits.

5.5.1
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Duplicate Summary

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Job Number: JC57521
 Account: ESCVAR WSP Environment & Energy
 Project: Kop-Flex, Hanover, VA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC57147-2DUP	1B113065.D	1	12/19/17	BK	n/a	n/a	V1B5401
JC57147-2	1B113061.D	1	12/19/17	BK	n/a	n/a	V1B5401

The QC reported here applies to the following samples:

Method: EPA 524.2 REV 4.1

JC57521-1, JC57521-2, JC57521-3

CAS No.	Compound	JC57147-2		Q	RPD	Limits
		ug/l	ug/l			
10061-01-5	cis-1,3-Dichloropropene	ND	ND	nc	10	
10061-02-6	trans-1,3-Dichloropropene	ND	ND	nc	10	
100-41-4	Ethylbenzene	ND	ND	nc	10	
87-68-3	Hexachlorobutadiene	ND	ND	nc	10	
591-78-6	2-Hexanone	ND	ND	nc	10	
98-82-8	Isopropylbenzene	ND	ND	nc	10	
99-87-6	p-Isopropyltoluene	ND	ND	nc	10	
75-09-2	Methylene chloride	ND	ND	nc	10	
1634-04-4	Methyl Tert Butyl Ether	ND	ND	nc	10	
108-10-1	4-Methyl-2-pentanone	ND	ND	nc	10	
91-20-3	Naphthalene	ND	ND	nc	10	
103-65-1	n-Propylbenzene	ND	ND	nc	10	
100-42-5	Styrene	ND	ND	nc	10	
630-20-6	1,1,1,2-Tetrachloroethane	ND	ND	nc	10	
71-55-6	1,1,1-Trichloroethane	ND	ND	nc	10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	nc	10	
79-00-5	1,1,2-Trichloroethane	ND	ND	nc	10	
87-61-6	1,2,3-Trichlorobenzene	ND	ND	nc	10	
96-18-4	1,2,3-Trichloropropane	ND	ND	nc	10	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	nc	10	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	nc	10	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	nc	10	
127-18-4	Tetrachloroethylene	ND	ND	nc	10	
108-88-3	Toluene	ND	ND	nc	10	
79-01-6	Trichloroethylene	ND	ND	nc	10	
75-69-4	Trichlorofluoromethane	ND	ND	nc	10	
75-01-4	Vinyl chloride	ND	ND	nc	10	
	m,p-Xylene	ND	ND	nc	10	
95-47-6	o-Xylene	ND	ND	nc	10	
1330-20-7	Xylenes (total)	ND	ND	nc	10	

CAS No.	Surrogate Recoveries	DUP	JC57147-2	Limits
2199-69-1	1,2-Dichlorobenzene-d4	88%	84%	70-130%
460-00-4	4-Bromofluorobenzene	85%	90%	70-130%

* = Outside of Control Limits.

5.5.1
5

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5397-BFB	Injection Date:	12/04/17
Lab File ID:	1B112976.D	Injection Time:	22:22
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	4098	24.6	Pass
75	30.0 - 80.0% of mass 95	9801	58.9	Pass
95	Base peak, 100% relative abundance	16653	100.0	Pass
96	5.0 - 9.0% of mass 95	1134	6.81	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	15388	92.4	Pass
175	5.0 - 9.0% of mass 174	1089	6.54	(7.08) ^a Pass
176	95.0 - 101.0% of mass 174	15162	91.0	(98.5) ^a Pass
177	5.0 - 9.0% of mass 176	1036	6.22	(6.83) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5397-IC5397	1B112977.D	12/04/17	23:02	00:40	Initial cal 0.2
V1B5397-IC5397	1B112978.D	12/04/17	23:34	01:12	Initial cal 0.5
V1B5397-IC5397	1B112979.D	12/05/17	00:05	01:43	Initial cal 1
V1B5397-IC5397	1B112980.D	12/05/17	00:37	02:15	Initial cal 2
V1B5397-IC5397	1B112981.D	12/05/17	01:08	02:46	Initial cal 5
V1B5397-ICC5397	1B112982.D	12/05/17	01:40	03:18	Initial cal 10
V1B5397-IC5397	1B112983.D	12/05/17	02:11	03:49	Initial cal 20
V1B5397-IC5397	1B112984.D	12/05/17	02:43	04:21	Initial cal 40
V1B5397-IC5397	1B112985.D	12/05/17	03:15	04:53	Initial cal 80
V1B5397-ICV5397	1B112988.D	12/05/17	04:50	06:28	Initial cal verification 10

Instrument Performance Check (BFB)

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5397-BFB2	Injection Date:	12/05/17
Lab File ID:	1B112991.D	Injection Time:	11:08
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	4005	21.8	Pass
75	30.0 - 80.0% of mass 95	9965	54.3	Pass
95	Base peak, 100% relative abundance	18360	100.0	Pass
96	5.0 - 9.0% of mass 95	978	5.33	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	17213	93.8	Pass
175	5.0 - 9.0% of mass 174	1298	7.07	(7.54) ^a Pass
176	95.0 - 101.0% of mass 174	16770	91.3	(97.4) ^a Pass
177	5.0 - 9.0% of mass 176	1297	7.06	(7.73) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5397-ICV5397	1B112992.D	12/05/17	11:49	00:41	Initial cal verification 10

Instrument Performance Check (BFB)

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V1B5401-BFB	Injection Date:	12/19/17
Lab File ID:	1B113056.D	Injection Time:	11:42
Instrument ID:	GCMS1B		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	14.99 - 40.0% of mass 95	2923	21.4	Pass
75	30.0 - 80.0% of mass 95	7740	56.8	Pass
95	Base peak, 100% relative abundance	13632	100.0	Pass
96	5.0 - 9.0% of mass 95	936	6.87	Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) ^a Pass
174	50.0 - 120.0% of mass 95	11839	86.8	Pass
175	5.0 - 9.0% of mass 174	935	6.86	(7.90) ^a Pass
176	95.0 - 101.0% of mass 174	11675	85.6	(98.6) ^a Pass
177	5.0 - 9.0% of mass 176	860	6.31	(7.37) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V1B5401-CC5397	1B113057.D	12/19/17	12:34	00:52	Continuing cal 5
V1B5401-MB	1B113058.D	12/19/17	13:06	01:24	Method Blank
V1B5401-BS	1B113059.D	12/19/17	13:56	02:14	Blank Spike
JC57147-1	1B113060.D	12/19/17	14:37	02:55	(used for QC only; not part of job JC57521)
JC57147-2	1B113061.D	12/19/17	15:09	03:27	(used for QC only; not part of job JC57521)
ZZZZZZ	1B113062.D	12/19/17	15:40	03:58	(unrelated sample)
ZZZZZZ	1B113063.D	12/19/17	16:12	04:30	(unrelated sample)
JC57147-1MS	1B113064.D	12/19/17	16:44	05:02	Matrix Spike
JC57147-2DUP	1B113065.D	12/19/17	17:16	05:34	Duplicate
ZZZZZZ	1B113066.D	12/19/17	17:48	06:06	(unrelated sample)
ZZZZZZ	1B113067.D	12/19/17	18:20	06:38	(unrelated sample)
ZZZZZZ	1B113068.D	12/19/17	18:52	07:10	(unrelated sample)
ZZZZZZ	1B113069.D	12/19/17	19:24	07:42	(unrelated sample)
ZZZZZZ	1B113070.D	12/19/17	19:56	08:14	(unrelated sample)
ZZZZZZ	1B113071.D	12/19/17	20:28	08:46	(unrelated sample)
ZZZZZZ	1B113072.D	12/19/17	21:00	09:18	(unrelated sample)
ZZZZZZ	1B113073.D	12/19/17	21:31	09:49	(unrelated sample)
ZZZZZZ	1B113074.D	12/19/17	22:03	10:21	(unrelated sample)
JC57521-1	1B113075.D	12/19/17	22:35	10:53	RW-1227OCM-121517
JC57521-2	1B113076.D	12/19/17	23:07	11:25	RW-1227OCM-121517-F
JC57521-3	1B113077.D	12/19/17	23:39	11:57	TB-121517

Instrument Performance Check (BFB)

Page 1 of 1

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample: V3A6816-BFB
Lab File ID: 3A158421.D
Instrument ID: GCMS3A

Injection Date: 12/05/17
Injection Time: 16:08

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	5563	18.0	Pass
75	30.0 - 60.0% of mass 95	13825	44.8	Pass
95	Base peak, 100% relative abundance	30872	100.0	Pass
96	5.0 - 9.0% of mass 95	2264	7.33	Pass
173	Less than 2.0% of mass 174	119	0.39	(0.43) ^a Pass
174	50.0 - 120.0% of mass 95	27528	89.2	Pass
175	5.0 - 9.0% of mass 174	2211	7.16	(8.03) ^a Pass
176	95.0 - 101.0% of mass 174	26752	86.7	(97.2) ^a Pass
177	5.0 - 9.0% of mass 176	1714	5.55	(6.41) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6816-IC6816	3A158422.D	12/05/17	16:36	00:28	Initial cal 0.25
V3A6816-IC6816	3A158423.D	12/05/17	17:02	00:54	Initial cal 0.4
V3A6816-IC6816	3A158424.D	12/05/17	17:28	01:20	Initial cal 1
V3A6816-IC6816	3A158425.D	12/05/17	17:54	01:46	Initial cal 2
V3A6816-IC6816	3A158426.D	12/05/17	18:20	02:12	Initial cal 5
V3A6816-ICC6816	3A158427.D	12/05/17	18:46	02:38	Initial cal 20
V3A6816-IC6816	3A158428.D	12/05/17	19:11	03:03	Initial cal 50
V3A6816-IC6816	3A158429.D	12/05/17	19:37	03:29	Initial cal 100
V3A6816-IC6816	3A158430.D	12/05/17	20:03	03:55	Initial cal 200
V3A6816-ICV6816	3A158433.D	12/05/17	21:21	05:13	Initial cal verification 20

Instrument Performance Check (BFB)

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Sample:	V3A6822-BFB	Injection Date:	12/19/17
Lab File ID:	3A158575.D	Injection Time:	09:33
Instrument ID:	GCMS3A		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance	Pass/Fail
50	15.0 - 40.0% of mass 95	5228	16.3	Pass
75	30.0 - 60.0% of mass 95	14107	44.0	Pass
95	Base peak, 100% relative abundance	32050	100.0	Pass
96	5.0 - 9.0% of mass 95	1783	5.56	Pass
173	Less than 2.0% of mass 174	122	0.38	(0.43) ^a Pass
174	50.0 - 120.0% of mass 95	28424	88.7	Pass
175	5.0 - 9.0% of mass 174	2207	6.89	(7.76) ^a Pass
176	95.0 - 101.0% of mass 174	27592	86.1	(97.1) ^a Pass
177	5.0 - 9.0% of mass 176	1827	5.70	(6.62) ^b Pass

(a) Value is % of mass 174

(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
V3A6822-CC6816	3A158576.D	12/19/17	10:02	00:29	Continuing cal 5
V3A6822-MB	3A158577.D	12/19/17	10:35	01:02	Method Blank
V3A6822-BS	3A158578.D	12/19/17	11:29	01:56	Blank Spike
JC57441-1	3A158580.D	12/19/17	12:29	02:56	(used for QC only; not part of job JC57521)
ZZZZZZ	3A158581.D	12/19/17	12:56	03:23	(unrelated sample)
ZZZZZZ	3A158582.D	12/19/17	13:22	03:49	(unrelated sample)
ZZZZZZ	3A158583.D	12/19/17	13:49	04:16	(unrelated sample)
ZZZZZZ	3A158584.D	12/19/17	14:15	04:42	(unrelated sample)
ZZZZZZ	3A158585.D	12/19/17	14:41	05:08	(unrelated sample)
ZZZZZZ	3A158586.D	12/19/17	15:07	05:34	(unrelated sample)
ZZZZZZ	3A158587.D	12/19/17	15:33	06:00	(unrelated sample)
ZZZZZZ	3A158588.D	12/19/17	15:58	06:25	(unrelated sample)
JC57441-1MS	3A158589.D	12/19/17	16:24	06:51	Matrix Spike
JC57441-1MSD	3A158590.D	12/19/17	16:50	07:17	Matrix Spike Duplicate
JC57521-1	3A158592.D	12/19/17	17:42	08:09	RW-1227OCM-121517
JC57521-2	3A158593.D	12/19/17	18:08	08:35	RW-1227OCM-121517-F
JC57521-3	3A158594.D	12/19/17	18:34	09:01	TB-121517

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: EPA 524.2 REV 4.1

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2
JC57521-1	1B113075.D	86	79
JC57521-2	1B113076.D	88	85
JC57521-3	1B113077.D	98	85
JC57147-1MS	1B113064.D	101	94
JC57147-2DUP	1B113065.D	88	85
V1B5401-BS	1B113059.D	103	93
V1B5401-MB	1B113058.D	90	86

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = 1,2-Dichlorobenzene-d4	70-130%
S2 = 4-Bromofluorobenzene	70-130%

5.7.1
5

Surrogate Recovery Summary

Page 1 of 1

Job Number: JC57521

Account: ESCVAR WSP Environment & Energy

Project: Kop-Flex, Hanover, VA

Method: SW846 8260C BY SIM

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1
JC57521-1	3A158592.D	97
JC57521-2	3A158593.D	94
JC57521-3	3A158594.D	91
JC57441-1MS	3A158589.D	100
JC57441-1MSD	3A158590.D	113
V3A6822-BS	3A158578.D	95
V3A6822-MB	3A158577.D	60

Surrogate
Compounds

Recovery
Limits

S1 = 1,4-Dioxane-d8

51-175%

5.7.2
5

**ENCLOSURE C – LABORATORY ANALYTICAL REPORT FOR OFFSITE
GROUNDWATER MONITORING WELL SAMPLES
(NOVEMBER 2017)**

November 30, 2017

Eric Johnson
WSP USA
13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171

RE: Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

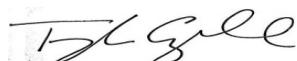
Dear Eric Johnson:

Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Taylor Ezell
taylor.ezell@pacelabs.com
(704)875-9092
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92363693001	MW-2400	Water	11/14/17 09:30	11/16/17 09:40
92363693002	MW-24D	Water	11/14/17 09:45	11/16/17 09:40
92363693003	MW-33D275	Water	11/14/17 10:48	11/16/17 09:40
92363693004	MW-33D295	Water	11/14/17 10:55	11/16/17 09:40
92363693005	MW-28	Water	11/14/17 11:30	11/16/17 09:40
92363693006	MW-28D	Water	11/14/17 11:40	11/16/17 09:40
92363693007	MW-35D	Water	11/14/17 12:00	11/16/17 09:40
92363693008	MW-31D	Water	11/14/17 13:15	11/16/17 09:40
92363693009	MW-25	Water	11/14/17 15:25	11/16/17 09:40
92363693010	MW-25D-130	Water	11/14/17 15:52	11/16/17 09:40
92363693011	MW-25D-190	Water	11/14/17 15:33	11/16/17 09:40
92363693012	MW-2500	Water	11/14/17 15:30	11/16/17 09:40
92363693013	TB-111417	Water	11/14/17 00:00	11/16/17 09:40

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SAMPLE ANALYTE COUNT

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92363693001	MW-2400	EPA 8260B Mod.	DLK	3	PASI-C
92363693002	MW-24D	EPA 8260B Mod.	DLK	3	PASI-C
92363693003	MW-33D275	EPA 8260B Mod.	DLK	3	PASI-C
92363693004	MW-33D295	EPA 8260B Mod.	DLK	3	PASI-C
92363693005	MW-28	EPA 8260B Mod.	DLK	3	PASI-C
92363693006	MW-28D	EPA 8260B Mod.	DLK	3	PASI-C
92363693007	MW-35D	EPA 8260B Mod.	DLK	3	PASI-C
92363693008	MW-31D	EPA 8260B Mod.	DLK	3	PASI-C
92363693009	MW-25	EPA 8260B Mod.	DLK	3	PASI-C
92363693010	MW-25D-130	EPA 8260B Mod.	DLK	3	PASI-C
92363693011	MW-25D-190	EPA 8260B Mod.	DLK	3	PASI-C
92363693012	MW-2500	EPA 8260B Mod.	DLK	3	PASI-C
92363693013	TB-111417	EPA 8260B Mod.	DLK	3	PASI-C

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-2400	Lab ID: 92363693001	Collected: 11/14/17 09:30	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	227	ug/L	10.0	5			123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	86	%	50-150	1			17060-07-0	
Toluene-d8 (S)	64	%	50-150	1			2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-24D	Lab ID: 92363693002	Collected: 11/14/17 09:45	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	212	ug/L	10.0	5		11/22/17 22:09	123-91-1	
1,2-Dichloroethane-d4 (S)	85	%	50-150	2.5		11/22/17 04:57	17060-07-0	
Toluene-d8 (S)	64	%	50-150	2.5		11/22/17 04:57	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-33D275	Lab ID: 92363693003	Collected: 11/14/17 10:48	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	4.3	ug/L	2.0	1			123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	50-150	1			17060-07-0	
Toluene-d8 (S)	98	%	50-150	1			2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-33D295	Lab ID: 92363693004	Collected: 11/14/17 10:55	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	9.7	ug/L	2.0	1			123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	50-150	1			17060-07-0	
Toluene-d8 (S)	81	%	50-150	1			2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-28	Lab ID: 92363693005	Collected: 11/14/17 11:30	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	ND	ug/L	2.0	1		11/22/17 05:35	123-91-1	
1,2-Dichloroethane-d4 (S)	78	%	50-150	1		11/22/17 05:35	17060-07-0	
Toluene-d8 (S)	65	%	50-150	1		11/22/17 05:35	2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-28D	Lab ID: 92363693006	Collected: 11/14/17 11:40	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	3.5	ug/L	2.0	1			123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	50-150	1			17060-07-0	
Toluene-d8 (S)	101	%	50-150	1			2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-35D	Lab ID: 92363693007	Collected: 11/14/17 12:00	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	ND	ug/L	2.0	1			123-91-1	
1,2-Dichloroethane-d4 (S)	91	%	50-150	1			17060-07-0	
Toluene-d8 (S)	97	%	50-150	1			2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-31D	Lab ID: 92363693008	Collected: 11/14/17 13:15	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	ND	ug/L	2.0	1			11/22/17 23:43	123-91-1
1,2-Dichloroethane-d4 (S)	96	%	50-150	1			11/22/17 23:43	17060-07-0
Toluene-d8 (S)	102	%	50-150	1			11/22/17 23:43	2037-26-5

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-25	Lab ID: 92363693009	Collected: 11/14/17 15:25	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	ND	ug/L	2.0	1			11/23/17 00:02	123-91-1
1,2-Dichloroethane-d4 (S)	92	%	50-150	1			11/23/17 00:02	17060-07-0
Toluene-d8 (S)	89	%	50-150	1			11/23/17 00:02	2037-26-5

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-25D-130	Lab ID: 92363693010	Collected: 11/14/17 15:52	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	58.5	ug/L	2.0	1		11/24/17 12:28	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	50-150	1		11/24/17 12:28	17060-07-0	
Toluene-d8 (S)	102	%	50-150	1		11/24/17 12:28	2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

Sample: MW-25D-190	Lab ID: 92363693011	Collected: 11/14/17 15:33	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane) Surrogates	56.7	ug/L	2.0	1		11/23/17 00:39	123-91-1	
1,2-Dichloroethane-d4 (S)	100	%	50-150	1		11/23/17 00:39	17060-07-0	
Toluene-d8 (S)	103	%	50-150	1		11/23/17 00:39	2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: MW-2500	Lab ID: 92363693012	Collected: 11/14/17 15:30	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	61.0	ug/L	2.0	1		11/23/17 00:58	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	50-150	1		11/23/17 00:58	17060-07-0	
Toluene-d8 (S)	104	%	50-150	1		11/23/17 00:58	2037-26-5	

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ANALYTICAL RESULTS

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

Sample: TB-111417	Lab ID: 92363693013	Collected: 11/14/17 00:00	Received: 11/16/17 09:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		11/24/17 11:50	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%	50-150	1		11/24/17 11:50	17060-07-0	
Toluene-d8 (S)	99	%	50-150	1		11/24/17 11:50	2037-26-5	

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QUALITY CONTROL DATA

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

QC Batch: 387897 Analysis Method: EPA 8260B Mod.

QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM

Associated Lab Samples: 92363693004

METHOD BLANK: 2152153 Matrix: Water

Associated Lab Samples: 92363693004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	11/21/17 19:12	
1,2-Dichloroethane-d4 (S)	%	107	50-150	11/21/17 19:12	
Toluene-d8 (S)	%	95	50-150	11/21/17 19:12	

LABORATORY CONTROL SAMPLE: 2152154

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.0	100	71-125	
1,2-Dichloroethane-d4 (S)	%			107	50-150	
Toluene-d8 (S)	%			94	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152155 2152156

Parameter	Units	92363693004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Max Qual
1,4-Dioxane (p-Dioxane)	ug/L	9.7	20	20	32.3	37.7	113	140	50-150	15	30	
1,2-Dichloroethane-d4 (S)	%						97	97	50-150		150	
Toluene-d8 (S)	%						78	75	50-150		150	

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QUALITY CONTROL DATA

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

QC Batch: 387898 Analysis Method: EPA 8260B Mod.

QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM

Associated Lab Samples: 92363693001, 92363693002, 92363693005

METHOD BLANK: 2152169 Matrix: Water

Associated Lab Samples: 92363693001, 92363693002, 92363693005

Parameter	Units	Blank	Reporting	Analyzed	Qualifiers
		Result	Limit		
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	11/21/17 18:54	
1,2-Dichloroethane-d4 (S)	%	102	50-150	11/21/17 18:54	
Toluene-d8 (S)	%	101	50-150	11/21/17 18:54	

LABORATORY CONTROL SAMPLE: 2152170

Parameter	Units	Spike	LCS	LCS	% Rec	Qualifiers
		Conc.	Result	% Rec	Limits	
1,4-Dioxane (p-Dioxane)	ug/L	20	20.7	104	71-125	
1,2-Dichloroethane-d4 (S)	%			105	50-150	
Toluene-d8 (S)	%			98	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2153698 2153699

Parameter	Units	92363691009	MS	MSD	MS	MSD	MS	MSD	% Rec	% Rec	Max	RPD	RPD	Qual
		Result	Spike	Spike										
1,4-Dioxane (p-Dioxane)	ug/L	ND	20	20	25.3	16.3	126	82	50-150	43	30	R1		
1,2-Dichloroethane-d4 (S)	%						100	98	50-150		150			
Toluene-d8 (S)	%						104	97	50-150		150			

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QUALITY CONTROL DATA

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

QC Batch: 388013 Analysis Method: EPA 8260B Mod.

QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM

Associated Lab Samples: 92363693003, 92363693006, 92363693007, 92363693008, 92363693009, 92363693011, 92363693012

METHOD BLANK: 2152834 Matrix: Water

Associated Lab Samples: 92363693003, 92363693006, 92363693007, 92363693008, 92363693009, 92363693011, 92363693012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	11/22/17 20:15	
1,2-Dichloroethane-d4 (S)	%	95	50-150	11/22/17 20:15	
Toluene-d8 (S)	%	98	50-150	11/22/17 20:15	

LABORATORY CONTROL SAMPLE: 2152835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	23.4	117	71-125	
1,2-Dichloroethane-d4 (S)	%			105	50-150	
Toluene-d8 (S)	%			101	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2152836 2152837

Parameter	Units	35348432018 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Max Qual
1,4-Dioxane (p-Dioxane)	ug/L	1.9U	20	20	23.6	22.6	118	113	50-150	4	30	
1,2-Dichloroethane-d4 (S)	%						103	103	50-150		150	
Toluene-d8 (S)	%						100	100	50-150		150	

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QUALITY CONTROL DATA

Project: KOPFLEX- ONSITE

Pace Project No.: 92363693

QC Batch: 388151 Analysis Method: EPA 8260B Mod.

QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM

Associated Lab Samples: 92363693010, 92363693013

METHOD BLANK: 2153716 Matrix: Water

Associated Lab Samples: 92363693010, 92363693013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	11/24/17 11:31	
1,2-Dichloroethane-d4 (S)	%	99	50-150	11/24/17 11:31	
Toluene-d8 (S)	%	99	50-150	11/24/17 11:31	

LABORATORY CONTROL SAMPLE: 2153717

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	21.2	106	71-125	
1,2-Dichloroethane-d4 (S)	%			93	50-150	
Toluene-d8 (S)	%			97	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2153718 2153719

Parameter	Units	35348510045 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Max Qual
1,4-Dioxane (p-Dioxane)	ug/L	1.9U	20	20	20.6	22.5	103	113	50-150	9	30	
1,2-Dichloroethane-d4 (S)	%						103	103	50-150		150	
Toluene-d8 (S)	%						103	104	50-150		150	

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QUALIFIERS

Project: KOPFLEX- ONSITE
Pace Project No.: 92363693

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: KOPFLEX- ONSITE
 Pace Project No.: 92363693

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92363693001	MW-2400	EPA 8260B Mod.	387898		
92363693002	MW-24D	EPA 8260B Mod.	387898		
92363693003	MW-33D275	EPA 8260B Mod.	388013		
92363693004	MW-33D295	EPA 8260B Mod.	387897		
92363693005	MW-28	EPA 8260B Mod.	387898		
92363693006	MW-28D	EPA 8260B Mod.	388013		
92363693007	MW-35D	EPA 8260B Mod.	388013		
92363693008	MW-31D	EPA 8260B Mod.	388013		
92363693009	MW-25	EPA 8260B Mod.	388013		
92363693010	MW-25D-130	EPA 8260B Mod.	388151		
92363693011	MW-25D-190	EPA 8260B Mod.	388013		
92363693012	MW-2500	EPA 8260B Mod.	388013		
92363693013	TB-111417	EPA 8260B Mod.	388151		

REPORT OF LABORATORY ANALYSIS

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<i>Pace Analytical</i>	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: August 4, 2017 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.04	Issuing Authority: Pace Quality Office

Laboratory receiving samples:
Asheville Eden Greenwood Huntersville Raleigh Mechanicsville
**Sample Condition
Upon Receipt**
Client Name: *WSP*

Proj#

WO# : 92363693

Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Custody Seal Present? Yes No Seals Intact? Yes No

Date/Initials Person Examining Contents: *(DW)(10/17)*Packing Material: Bubble Wrap Bubble Bags None Other**Biological Tissue Frozen?**Thermometer: *T/T* R Gun ID: *111111* Type of Ice: Wet Blue None Yes No N/ACorrection Factor: Cooler Temp Corrected (°C): *11*

Temp should be above freezing to 6°C

 Samples out of temp criteria. Samples on ice, cooling process has begunUSDA Regulated Soil N/A, water sample

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?

 Yes NoDid samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

			Comments/Discrepancy:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Short Hold Time Analysis (<72 hr.)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Sufficient Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Correct Containers Used? -Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Dissolved analysis: Samples Field Filtered?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
-Includes Date/Time/ID/Analysis Matrix:	<i>W</i>		
Headspace in VOA Vials (>5-6mm)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Trip Blank Present?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

CLIENT NOTIFICATION/RESOLUTIONField Data Required? Yes No

Person Contacted: _____

Date/Time: _____

Comments/Sample Discrepancy: _____

Lot ID of split containers: _____

Project Manager SCURF Review: _____

Date: *11/17*

Project Manager SRF Review: _____

Date: *11/17*

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)



Document Name:
Sample Condition Upon Receipt(SCUR)

Document Revised: August 4, 2017

Page 2 of 2

Document No.:
F-CAR-CS-033-Rev.04

Issuing Authority:
Pace Quality Office

*Check mark top half of box if pH and/or dechlorination
is verified and within the acceptance range for
preservation samples.

**Bottom half of box is to list number of bottles

Project **WO# : 92363693**

PM: PTE Due Date: 11/27/17
CLIENT: 92-WSP

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic Zn Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A - lab)	SP2T-250 mL Sterile Plastic (N/A - lab)	BP3A-250 mL Plastic (NH4)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
2	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
3	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
4	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
5	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
6	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
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12	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: August 4, 2017 Page 2 of 2
	Document No.: F-CAR-CS-033-Rev.04	Issuing Authority: Pace Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project #

WO# : 92363693

PM: PTE

Due Date: 11/27/17

CLIENT: 92-WSP

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WG FU-Wide-mouthed Glass Jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A - lab)	SP2T-250 mL Sterile Plastic (N/A - lab)	BP3A-250 mL Plastic (NH4)2SO4 (9.3-9.7)	VSGU-20 mL Scintillation vials (N/A)	Cubitainer	GN
1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
2	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			
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12	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

CHAIN-OF-CUSTODY RECORD

Off Site

Page 1 of 1

WSP USA Office Address

3526 Dukes Technology Drive # 300

Project Name

Hogflek - Offsite

Project Location

Harper MD

Project Number & Task

31400389-

Sampler(s) Name(s)

Mark Kugler
Chris Cressi

WSP USA Contact Name

Eric Johnson
WSP USA Contact E-mail
eric.johnson@wsp.com

WSP USA Contact Phone

(403) 709-6500

Sampler(s) Signature(s)

Sample Identification

Matrix

Collection Sheet

Retention Date

Date

Time

Number of Containers

Sample Comments

No.

008205

WSP

1

Page 27 of 74

Requested Analyses & Preservatives

Laboratory Name & Location

Race Analytical

Laboratory Project Manager

Standard

24 HR

48 HR

72 HR

— HR

9234030B

MW-2400 AQ 11/14/17 0930 6 X X VOCS (8260)

601

MW-24D AQ 11/14/17 0945 6 X X Dioxane (8260 SIM)

OC2

MW-33D 275 AQ 11/14/17 1048 6 X X

OC3

MW-33D 295 AQ 11/14/17 1055 6 + X

OC4

MW-28 AQ 11/14/17 1130 6 + X

OC5

MW-28D AQ 11/14/17 1140 6 X X

OC6

MW-35D AQ 11/14/17 1200 6 X X

OC7

MW-31D AQ 11/14/17 1315 6 X X

OC8

MW-25 AQ 11/14/17 1525 6 X X

OC9

MW-25D-13C AQ 11/14/17 1552 X X X

OC10

MW-25D-190 AQ 11/14/17 1533 X X X

OC11

MW-2500 AQ 11/14/17 1530 6 X X

OC12

TB-11417 AQ ~~11/14/17~~ 4 X X

Top blank OC13

Relinquished By (Signature)

Date 11/17

Time 1400

Received By (Signature)

Date

Time

Shipment Method

Tracking Number(s)

Relinquished By (Signature)

Date

Time

Received By (Signature)

Date

Time

Number of Packages

Custody Seal Number(s)

*Use stop time/date for composite and/or air samples; use only start time/date for all other samples.

Matrix: AQ = Aqueous, S = Soil, SE = Sediment, A = Air, W = Wipe, B = Bulk, O = Other (detail in comments)

November 29, 2017

Pace Analytical - Huntersville, NC

Sample Delivery Group: L952655
Samples Received: 11/21/2017
Project Number: 92363693
Description: KOPLEX- ONSITE

Report To: Taylor Ezell
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078

Entire Report Reviewed By:



Nancy McLain
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



Cp: Cover Page	1	1 Cp
Tc: Table of Contents	2	2 Tc
Ss: Sample Summary	3	3 Ss
Cn: Case Narrative	5	4 Cn
Sr: Sample Results	6	5 Sr
MW-2400 L952655-01	6	6 Qc
MW-24D L952655-02	8	7 Gl
MW-33D275 L952655-03	10	8 Al
MW-33D295 L952655-04	12	9 Sc
MW-28 L952655-05	14	
MW-28D L952655-06	16	
MW-35D L952655-07	18	
MW-31D L952655-08	20	
MW-25 L952655-09	22	
MW-25D-130 L952655-10	24	
MW-25D-190 L952655-11	26	
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Sc: Sample Chain of Custody	42	

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



				Collected by	Collected date/time	Received date/time
					11/14/17 09:30	11/21/17 08:45
MW-2400 L952655-01 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 01:19	11/23/17 01:19	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	50	11/28/17 13:12	11/28/17 13:12	BMB
MW-24D L952655-02 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 01:39	11/23/17 01:39	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	10	11/28/17 13:32	11/28/17 13:32	BMB
MW-33D275 L952655-03 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 02:00	11/23/17 02:00	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/28/17 13:52	11/28/17 13:52	BMB
MW-33D295 L952655-04 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 02:19	11/23/17 02:19	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/28/17 14:12	11/28/17 14:12	BMB
MW-28 L952655-05 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 02:39	11/23/17 02:39	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/28/17 14:32	11/28/17 14:32	BMB
MW-28D L952655-06 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 03:00	11/23/17 03:00	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/28/17 14:52	11/28/17 14:52	BMB
MW-35D L952655-07 GW	Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/23/17 03:20	11/23/17 03:20	LRL
Volatile Organic Compounds (GC/MS) by Method 8260B		WG1045909	1	11/28/17 15:12	11/28/17 15:12	BMB

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



				Collected by	Collected date/time	Received date/time
					11/14/17 13:15	11/21/17 08:45
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/23/17 03:40	11/23/17 03:40	LRL	
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/28/17 15:32	11/28/17 15:32	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 15:25	11/21/17 08:45
MW-25 L952655-09 GW				Collected by	Collected date/time	Received date/time
Method	Batch	Dilution	Preparation date/time		11/14/17 15:52	11/21/17 08:45
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/23/17 04:00	11/23/17 04:00	LRL	
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/28/17 15:52	11/28/17 15:52	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 15:52	11/21/17 08:45
MW-25D-130 L952655-10 GW				Collected by	Collected date/time	Received date/time
Method	Batch	Dilution	Preparation date/time		11/14/17 15:33	11/21/17 08:45
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/23/17 04:20	11/23/17 04:20	LRL	
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/28/17 16:12	11/28/17 16:12	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 15:33	11/21/17 08:45
MW-25D-190 L952655-11 GW				Collected by	Collected date/time	Received date/time
Method	Batch	Dilution	Preparation date/time		11/14/17 15:30	11/21/17 08:45
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/23/17 04:40	11/23/17 04:40	LRL	
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045909	1	11/28/17 16:32	11/28/17 16:32	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 15:30	11/21/17 08:45
MW-2500 L952655-12 GW				Collected by	Collected date/time	Received date/time
Method	Batch	Dilution	Preparation date/time		11/14/17 00:00	11/21/17 08:45
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045961	1	11/28/17 13:55	11/28/17 13:55	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 00:00	11/21/17 08:45
TB-111417 L952655-13 GW				Collected by	Collected date/time	Received date/time
Method	Batch	Dilution	Preparation date/time		11/14/17 00:00	11/21/17 08:45
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1045961	1	11/28/17 13:16	11/28/17 13:16	BMB	
				Collected by	Collected date/time	Received date/time
					11/14/17 00:00	11/21/17 08:45

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Technical Service Representative

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ GI
- ⁸ AI
- ⁹ SC



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 01:19	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 01:19	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 01:19	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 01:19	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 01:19	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 01:19	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 01:19	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 01:19	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 01:19	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 01:19	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 01:19	WG1045909	
Chloroform	0.587	J	0.324	5.00	1	11/23/2017 01:19	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 01:19	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 01:19	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 01:19	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 01:19	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 01:19	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 01:19	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 01:19	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 01:19	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 01:19	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 01:19	WG1045909	
1,1-Dichloroethane	38.5		0.259	1.00	1	11/23/2017 01:19	WG1045909	
1,2-Dichloroethane	4.53		0.361	1.00	1	11/23/2017 01:19	WG1045909	
1,1-Dichloroethene	983		19.9	50.0	50	11/28/2017 13:12	WG1045909	
cis-1,2-Dichloroethene	3.20		0.260	1.00	1	11/23/2017 01:19	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 01:19	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 01:19	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 01:19	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 01:19	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 01:19	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 01:19	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 01:19	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 01:19	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 01:19	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 01:19	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 01:19	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 01:19	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 01:19	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 01:19	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 01:19	WG1045909	
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 01:19	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 01:19	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 01:19	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 01:19	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 01:19	WG1045909	
Tetrachloroethene	U		18.6	50.0	50	11/28/2017 13:12	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 01:19	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 01:19	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 01:19	WG1045909	
1,1,1-Trichloroethane	16.8		0.319	1.00	1	11/23/2017 01:19	WG1045909	
1,1,2-Trichloroethane	0.755	J	0.383	1.00	1	11/23/2017 01:19	WG1045909	
Trichloroethene	10.2		0.398	1.00	1	11/23/2017 01:19	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 01:19	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 01:19	WG1045909	
Vinyl chloride	0.341	J	0.259	1.00	1	11/23/2017 01:19	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/23/2017 01:19	WG1045909	¹ Cp
o-Xylene	U		0.341	1.00	1	11/23/2017 01:19	WG1045909	² Tc
m&p-Xylene	U		0.719	2.00	1	11/23/2017 01:19	WG1045909	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/23/2017 01:19	WG1045909	
(S) Toluene-d8	104			80.0-120		11/23/2017 01:19	WG1045909	
(S) Toluene-d8	105			80.0-120		11/28/2017 13:12	WG1045909	
(S) Dibromofluoromethane	98.6			76.0-123		11/28/2017 13:12	WG1045909	
(S) Dibromofluoromethane	98.8			76.0-123		11/23/2017 01:19	WG1045909	
(S) 4-Bromofluorobenzene	102			80.0-120		11/28/2017 13:12	WG1045909	
(S) 4-Bromofluorobenzene	105			80.0-120		11/23/2017 01:19	WG1045909	

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 01:39	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 01:39	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 01:39	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 01:39	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 01:39	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 01:39	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 01:39	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 01:39	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 01:39	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 01:39	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 01:39	WG1045909	
Chloroform	0.433	J	0.324	5.00	1	11/23/2017 01:39	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 01:39	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 01:39	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 01:39	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 01:39	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 01:39	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 01:39	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 01:39	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 01:39	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 01:39	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 01:39	WG1045909	
1,1-Dichloroethane	28.1		0.259	1.00	1	11/23/2017 01:39	WG1045909	
1,2-Dichloroethane	3.43		0.361	1.00	1	11/23/2017 01:39	WG1045909	
1,1-Dichloroethene	803		3.98	10.0	10	11/28/2017 13:32	WG1045909	
cis-1,2-Dichloroethene	2.28		0.260	1.00	1	11/23/2017 01:39	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 01:39	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 01:39	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 01:39	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 01:39	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 01:39	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 01:39	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 01:39	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 01:39	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 01:39	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 01:39	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 01:39	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 01:39	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 01:39	WG1045909	
Methylene Chloride	11.7		1.00	5.00	1	11/23/2017 01:39	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 01:39	WG1045909	
Methyl tert-butyl ether	0.971	J	0.367	1.00	1	11/23/2017 01:39	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 01:39	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 01:39	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 01:39	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 01:39	WG1045909	
Tetrachloroethene	U		3.72	10.0	10	11/28/2017 13:32	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 01:39	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 01:39	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 01:39	WG1045909	
1,1,1-Trichloroethane	10.5		0.319	1.00	1	11/23/2017 01:39	WG1045909	
1,1,2-Trichloroethane	0.520	J	0.383	1.00	1	11/23/2017 01:39	WG1045909	
Trichloroethene	5.85		0.398	1.00	1	11/23/2017 01:39	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 01:39	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 01:39	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 01:39	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 01:39	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 01:39	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 01:39	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 01:39	WG1045909
(S) Toluene-d8	104			80.0-120		11/28/2017 13:32	WG1045909
(S) Toluene-d8	103			80.0-120		11/23/2017 01:39	WG1045909
(S) Dibromofluoromethane	98.1			76.0-123		11/23/2017 01:39	WG1045909
(S) Dibromofluoromethane	99.8			76.0-123		11/28/2017 13:32	WG1045909
(S) 4-Bromofluorobenzene	102			80.0-120		11/23/2017 01:39	WG1045909
(S) 4-Bromofluorobenzene	100			80.0-120		11/28/2017 13:32	WG1045909

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch	
	ug/l		ug/l	ug/l				
Acetone	U		10.0	50.0	1	11/23/2017 02:00	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 02:00	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 02:00	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 02:00	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 02:00	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 02:00	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 02:00	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 02:00	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 02:00	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 02:00	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 02:00	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 02:00	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 02:00	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 02:00	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 02:00	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 02:00	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 02:00	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 02:00	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 02:00	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 02:00	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 02:00	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 02:00	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 02:00	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 02:00	WG1045909	
1,1-Dichloroethene	U		0.398	1.00	1	11/23/2017 02:00	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 02:00	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 02:00	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 02:00	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 02:00	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 02:00	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 02:00	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 02:00	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 02:00	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 02:00	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 02:00	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 02:00	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 02:00	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 02:00	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 02:00	WG1045909	
Methylene Chloride	12.0		1.00	5.00	1	11/23/2017 02:00	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 02:00	WG1045909	
Methyl tert-butyl ether	0.944	J	0.367	1.00	1	11/23/2017 02:00	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 02:00	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 02:00	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 02:00	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 02:00	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 13:52	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 02:00	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 02:00	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 02:00	WG1045909	
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 02:00	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 02:00	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 02:00	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 02:00	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 02:00	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 02:00	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 02:00	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 02:00	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 02:00	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 02:00	WG1045909
(S) Toluene-d8	105			80.0-120		11/23/2017 02:00	WG1045909
(S) Toluene-d8	105			80.0-120		11/28/2017 13:52	WG1045909
(S) Dibromofluoromethane	99.2			76.0-123		11/23/2017 02:00	WG1045909
(S) Dibromofluoromethane	101			76.0-123		11/28/2017 13:52	WG1045909
(S) 4-Bromofluorobenzene	101			80.0-120		11/28/2017 13:52	WG1045909
(S) 4-Bromofluorobenzene	103			80.0-120		11/23/2017 02:00	WG1045909

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 02:19	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 02:19	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 02:19	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 02:19	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 02:19	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 02:19	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 02:19	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 02:19	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 02:19	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 02:19	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 02:19	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 02:19	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 02:19	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 02:19	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 02:19	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 02:19	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 02:19	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 02:19	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 02:19	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 02:19	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 02:19	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 02:19	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 02:19	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 02:19	WG1045909	
1,1-Dichloroethene	3.42		0.398	1.00	1	11/23/2017 02:19	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 02:19	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 02:19	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 02:19	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 02:19	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 02:19	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 02:19	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 02:19	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 02:19	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 02:19	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 02:19	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 02:19	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 02:19	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 02:19	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 02:19	WG1045909	
Methylene Chloride	11.5		1.00	5.00	1	11/23/2017 02:19	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 02:19	WG1045909	
Methyl tert-butyl ether	0.959	J	0.367	1.00	1	11/23/2017 02:19	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 02:19	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 02:19	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 02:19	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 02:19	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 14:12	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 02:19	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 02:19	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 02:19	WG1045909	
1,1,1-Trichloroethane	0.492	J	0.319	1.00	1	11/23/2017 02:19	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 02:19	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 02:19	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 02:19	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 02:19	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 02:19	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/23/2017 02:19	WG1045909	¹ Cp
o-Xylene	U		0.341	1.00	1	11/23/2017 02:19	WG1045909	² Tc
m&p-Xylene	U		0.719	2.00	1	11/23/2017 02:19	WG1045909	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/23/2017 02:19	WG1045909	
(S) Toluene-d8	104			80.0-120		11/28/2017 14:12	WG1045909	
(S) Toluene-d8	104			80.0-120		11/23/2017 02:19	WG1045909	
(S) Dibromofluoromethane	100			76.0-123		11/28/2017 14:12	WG1045909	
(S) Dibromofluoromethane	99.3			76.0-123		11/23/2017 02:19	WG1045909	
(S) 4-Bromofluorobenzene	101			80.0-120		11/28/2017 14:12	WG1045909	
(S) 4-Bromofluorobenzene	105			80.0-120		11/23/2017 02:19	WG1045909	

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 02:39	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 02:39	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 02:39	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 02:39	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 02:39	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 02:39	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 02:39	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 02:39	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 02:39	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 02:39	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 02:39	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 02:39	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 02:39	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 02:39	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 02:39	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 02:39	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 02:39	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 02:39	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 02:39	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 02:39	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 02:39	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 02:39	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 02:39	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 02:39	WG1045909	
1,1-Dichloroethene	U		0.398	1.00	1	11/23/2017 02:39	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 02:39	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 02:39	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 02:39	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 02:39	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 02:39	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 02:39	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 02:39	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 02:39	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 02:39	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 02:39	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 02:39	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 02:39	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 02:39	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 02:39	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 02:39	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 02:39	WG1045909	
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 02:39	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 02:39	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 02:39	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 02:39	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 02:39	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 14:32	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 02:39	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 02:39	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 02:39	WG1045909	
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 02:39	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 02:39	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 02:39	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 02:39	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 02:39	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 02:39	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 02:39	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 02:39	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 02:39	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 02:39	WG1045909
(S) Toluene-d8	106			80.0-120		11/23/2017 02:39	WG1045909
(S) Toluene-d8	103			80.0-120		11/28/2017 14:32	WG1045909
(S) Dibromofluoromethane	98.4			76.0-123		11/23/2017 02:39	WG1045909
(S) Dibromofluoromethane	100			76.0-123		11/28/2017 14:32	WG1045909
(S) 4-Bromofluorobenzene	100			80.0-120		11/28/2017 14:32	WG1045909
(S) 4-Bromofluorobenzene	102			80.0-120		11/23/2017 02:39	WG1045909

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	11/23/2017 03:00	WG1045909
Benzene	0.780	J	0.331	1.00	1	11/23/2017 03:00	WG1045909
Bromobenzene	U		0.352	1.00	1	11/23/2017 03:00	WG1045909
Bromochloromethane	U		0.520	5.00	1	11/23/2017 03:00	WG1045909
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 03:00	WG1045909
Bromoform	U		0.469	1.00	1	11/23/2017 03:00	WG1045909
Bromomethane	U		0.866	5.00	1	11/23/2017 03:00	WG1045909
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 03:00	WG1045909
Chlorobenzene	U		0.348	1.00	1	11/23/2017 03:00	WG1045909
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 03:00	WG1045909
Chloroethane	U		0.453	5.00	1	11/23/2017 03:00	WG1045909
Chloroform	U		0.324	5.00	1	11/23/2017 03:00	WG1045909
Chloromethane	U		0.276	2.50	1	11/23/2017 03:00	WG1045909
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 03:00	WG1045909
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 03:00	WG1045909
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 03:00	WG1045909
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 03:00	WG1045909
Dibromomethane	U		0.346	1.00	1	11/23/2017 03:00	WG1045909
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 03:00	WG1045909
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 03:00	WG1045909
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 03:00	WG1045909
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 03:00	WG1045909
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 03:00	WG1045909
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 03:00	WG1045909
1,1-Dichloroethene	5.55		0.398	1.00	1	11/23/2017 03:00	WG1045909
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 03:00	WG1045909
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 03:00	WG1045909
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 03:00	WG1045909
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 03:00	WG1045909
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 03:00	WG1045909
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 03:00	WG1045909
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 03:00	WG1045909
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 03:00	WG1045909
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 03:00	WG1045909
Ethylbenzene	U		0.384	1.00	1	11/23/2017 03:00	WG1045909
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 03:00	WG1045909
2-Hexanone	U		3.82	10.0	1	11/23/2017 03:00	WG1045909
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 03:00	WG1045909
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 03:00	WG1045909
Methylene Chloride	U		1.00	5.00	1	11/23/2017 03:00	WG1045909
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 03:00	WG1045909
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 03:00	WG1045909
Naphthalene	U		1.00	5.00	1	11/23/2017 03:00	WG1045909
Styrene	U		0.307	1.00	1	11/23/2017 03:00	WG1045909
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 03:00	WG1045909
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 03:00	WG1045909
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 14:52	WG1045909
Toluene	U		0.412	1.00	1	11/23/2017 03:00	WG1045909
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 03:00	WG1045909
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 03:00	WG1045909
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 03:00	WG1045909
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 03:00	WG1045909
Trichloroethene	U		0.398	1.00	1	11/23/2017 03:00	WG1045909
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 03:00	WG1045909
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 03:00	WG1045909
Vinyl chloride	U		0.259	1.00	1	11/23/2017 03:00	WG1045909

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 03:00	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 03:00	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 03:00	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 03:00	WG1045909
(S) Toluene-d8	104			80.0-120		11/28/2017 14:52	WG1045909
(S) Toluene-d8	105			80.0-120		11/23/2017 03:00	WG1045909
(S) Dibromofluoromethane	98.9			76.0-123		11/23/2017 03:00	WG1045909
(S) Dibromofluoromethane	99.2			76.0-123		11/28/2017 14:52	WG1045909
(S) 4-Bromofluorobenzene	104			80.0-120		11/23/2017 03:00	WG1045909
(S) 4-Bromofluorobenzene	106			80.0-120		11/28/2017 14:52	WG1045909

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ GI⁸ Al⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 03:20	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 03:20	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 03:20	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 03:20	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 03:20	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 03:20	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 03:20	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 03:20	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 03:20	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 03:20	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 03:20	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 03:20	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 03:20	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 03:20	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 03:20	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 03:20	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 03:20	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 03:20	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 03:20	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 03:20	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 03:20	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 03:20	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 03:20	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 03:20	WG1045909	
1,1-Dichloroethene	U		0.398	1.00	1	11/23/2017 03:20	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 03:20	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 03:20	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 03:20	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 03:20	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 03:20	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 03:20	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 03:20	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 03:20	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 03:20	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 03:20	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 03:20	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 03:20	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 03:20	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 03:20	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 03:20	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 03:20	WG1045909	
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 03:20	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 03:20	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 03:20	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 03:20	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 03:20	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 15:12	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 03:20	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 03:20	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 03:20	WG1045909	
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 03:20	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 03:20	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 03:20	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 03:20	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 03:20	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 03:20	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/23/2017 03:20	WG1045909	¹ Cp
o-Xylene	U		0.341	1.00	1	11/23/2017 03:20	WG1045909	² Tc
m&p-Xylene	U		0.719	2.00	1	11/23/2017 03:20	WG1045909	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/23/2017 03:20	WG1045909	
(S) Toluene-d8	105			80.0-120		11/23/2017 03:20	WG1045909	
(S) Toluene-d8	106			80.0-120		11/28/2017 15:12	WG1045909	
(S) Dibromofluoromethane	97.4			76.0-123		11/23/2017 03:20	WG1045909	
(S) Dibromofluoromethane	101			76.0-123		11/28/2017 15:12	WG1045909	
(S) 4-Bromofluorobenzene	105			80.0-120		11/28/2017 15:12	WG1045909	
(S) 4-Bromofluorobenzene	104			80.0-120		11/23/2017 03:20	WG1045909	





Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 03:40	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 03:40	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 03:40	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 03:40	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 03:40	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 03:40	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 03:40	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 03:40	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 03:40	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 03:40	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 03:40	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 03:40	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 03:40	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 03:40	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 03:40	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 03:40	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 03:40	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 03:40	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 03:40	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 03:40	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 03:40	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 03:40	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 03:40	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 03:40	WG1045909	
1,1-Dichloroethene	U		0.398	1.00	1	11/23/2017 03:40	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 03:40	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 03:40	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 03:40	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 03:40	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 03:40	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 03:40	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 03:40	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 03:40	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 03:40	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 03:40	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 03:40	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 03:40	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 03:40	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 03:40	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 03:40	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 03:40	WG1045909	
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 03:40	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 03:40	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 03:40	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 03:40	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 03:40	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 15:32	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 03:40	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 03:40	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 03:40	WG1045909	
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 03:40	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 03:40	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 03:40	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 03:40	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 03:40	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 03:40	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 03:40	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 03:40	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 03:40	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 03:40	WG1045909
(S) Toluene-d8	104			80.0-120		11/23/2017 03:40	WG1045909
(S) Toluene-d8	103			80.0-120		11/28/2017 15:32	WG1045909
(S) Dibromofluoromethane	99.5			76.0-123		11/23/2017 03:40	WG1045909
(S) Dibromofluoromethane	99.5			76.0-123		11/28/2017 15:32	WG1045909
(S) 4-Bromofluorobenzene	99.6			80.0-120		11/23/2017 03:40	WG1045909
(S) 4-Bromofluorobenzene	102			80.0-120		11/28/2017 15:32	WG1045909

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ GI⁸ Al⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 04:00	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 04:00	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 04:00	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 04:00	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 04:00	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 04:00	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 04:00	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 04:00	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 04:00	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 04:00	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 04:00	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 04:00	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 04:00	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 04:00	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 04:00	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 04:00	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 04:00	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 04:00	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 04:00	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 04:00	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 04:00	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 04:00	WG1045909	
1,1-Dichloroethane	U		0.259	1.00	1	11/23/2017 04:00	WG1045909	
1,2-Dichloroethane	U		0.361	1.00	1	11/23/2017 04:00	WG1045909	
1,1-Dichloroethene	U		0.398	1.00	1	11/23/2017 04:00	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 04:00	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 04:00	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 04:00	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 04:00	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 04:00	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 04:00	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 04:00	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 04:00	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 04:00	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 04:00	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 04:00	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 04:00	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 04:00	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 04:00	WG1045909	
Methylene Chloride	11.7		1.00	5.00	1	11/23/2017 04:00	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 04:00	WG1045909	
Methyl tert-butyl ether	1.21		0.367	1.00	1	11/23/2017 04:00	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 04:00	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 04:00	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 04:00	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 04:00	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 15:52	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 04:00	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 04:00	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 04:00	WG1045909	
1,1,1-Trichloroethane	U		0.319	1.00	1	11/23/2017 04:00	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 04:00	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 04:00	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 04:00	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 04:00	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 04:00	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Vinyl acetate	U		1.63	10.0	1	11/23/2017 04:00	WG1045909
o-Xylene	U		0.341	1.00	1	11/23/2017 04:00	WG1045909
m&p-Xylene	U		0.719	2.00	1	11/23/2017 04:00	WG1045909
Xylenes, Total	U		1.06	3.00	1	11/23/2017 04:00	WG1045909
(S) Toluene-d8	106			80.0-120		11/28/2017 15:52	WG1045909
(S) Toluene-d8	104			80.0-120		11/23/2017 04:00	WG1045909
(S) Dibromofluoromethane	98.6			76.0-123		11/23/2017 04:00	WG1045909
(S) Dibromofluoromethane	99.8			76.0-123		11/28/2017 15:52	WG1045909
(S) 4-Bromofluorobenzene	102			80.0-120		11/28/2017 15:52	WG1045909
(S) 4-Bromofluorobenzene	103			80.0-120		11/23/2017 04:00	WG1045909

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 04:20	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 04:20	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 04:20	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 04:20	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 04:20	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 04:20	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 04:20	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 04:20	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 04:20	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 04:20	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 04:20	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 04:20	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 04:20	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 04:20	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 04:20	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 04:20	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 04:20	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 04:20	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 04:20	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 04:20	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 04:20	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 04:20	WG1045909	
1,1-Dichloroethane	5.12		0.259	1.00	1	11/23/2017 04:20	WG1045909	
1,2-Dichloroethane	1.25		0.361	1.00	1	11/23/2017 04:20	WG1045909	
1,1-Dichloroethene	151		0.398	1.00	1	11/23/2017 04:20	WG1045909	
cis-1,2-Dichloroethene	0.569	J	0.260	1.00	1	11/23/2017 04:20	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 04:20	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 04:20	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 04:20	WG1045909	
1,3-Dichloropropane	U		0.366	1.00	1	11/23/2017 04:20	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 04:20	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 04:20	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 04:20	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 04:20	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 04:20	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 04:20	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 04:20	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 04:20	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 04:20	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 04:20	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 04:20	WG1045909	
Methyl tert-butyl ether	U		0.367	1.00	1	11/23/2017 04:20	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 04:20	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 04:20	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 04:20	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 04:20	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 16:12	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 04:20	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 04:20	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 04:20	WG1045909	
1,1,1-Trichloroethane	6.42		0.319	1.00	1	11/23/2017 04:20	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 04:20	WG1045909	
Trichloroethene	1.06		0.398	1.00	1	11/23/2017 04:20	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 04:20	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 04:20	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 04:20	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/23/2017 04:20	WG1045909	¹ Cp
o-Xylene	U		0.341	1.00	1	11/23/2017 04:20	WG1045909	² Tc
m&p-Xylene	U		0.719	2.00	1	11/23/2017 04:20	WG1045909	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/23/2017 04:20	WG1045909	
(S) Toluene-d8	105			80.0-120		11/23/2017 04:20	WG1045909	
(S) Toluene-d8	103			80.0-120		11/28/2017 16:12	WG1045909	
(S) Dibromofluoromethane	101			76.0-123		11/28/2017 16:12	WG1045909	
(S) Dibromofluoromethane	99.2			76.0-123		11/23/2017 04:20	WG1045909	
(S) 4-Bromofluorobenzene	101			80.0-120		11/28/2017 16:12	WG1045909	
(S) 4-Bromofluorobenzene	103			80.0-120		11/23/2017 04:20	WG1045909	

- ¹Cp
- ²Tc
- ³Ss
- ⁴Cn
- ⁵Sr
- ⁶Qc
- ⁷Gl
- ⁸Al
- ⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	U		10.0	50.0	1	11/23/2017 04:40	WG1045909	¹ Cp
Benzene	U		0.331	1.00	1	11/23/2017 04:40	WG1045909	² Tc
Bromobenzene	U		0.352	1.00	1	11/23/2017 04:40	WG1045909	³ Ss
Bromochloromethane	U		0.520	5.00	1	11/23/2017 04:40	WG1045909	⁴ Cn
Bromodichloromethane	U		0.380	1.00	1	11/23/2017 04:40	WG1045909	⁵ Sr
Bromoform	U		0.469	1.00	1	11/23/2017 04:40	WG1045909	⁶ Qc
Bromomethane	U		0.866	5.00	1	11/23/2017 04:40	WG1045909	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	1	11/23/2017 04:40	WG1045909	⁸ Al
Chlorobenzene	U		0.348	1.00	1	11/23/2017 04:40	WG1045909	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	1	11/23/2017 04:40	WG1045909	
Chloroethane	U		0.453	5.00	1	11/23/2017 04:40	WG1045909	
Chloroform	U		0.324	5.00	1	11/23/2017 04:40	WG1045909	
Chloromethane	U		0.276	2.50	1	11/23/2017 04:40	WG1045909	
2-Chlorotoluene	U		0.375	1.00	1	11/23/2017 04:40	WG1045909	
4-Chlorotoluene	U		0.351	1.00	1	11/23/2017 04:40	WG1045909	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/23/2017 04:40	WG1045909	
1,2-Dibromoethane	U		0.381	1.00	1	11/23/2017 04:40	WG1045909	
Dibromomethane	U		0.346	1.00	1	11/23/2017 04:40	WG1045909	
1,2-Dichlorobenzene	U		0.349	1.00	1	11/23/2017 04:40	WG1045909	
1,3-Dichlorobenzene	U		0.220	1.00	1	11/23/2017 04:40	WG1045909	
1,4-Dichlorobenzene	U		0.274	1.00	1	11/23/2017 04:40	WG1045909	
Dichlorodifluoromethane	U		0.551	5.00	1	11/23/2017 04:40	WG1045909	
1,1-Dichloroethane	13.6		0.259	1.00	1	11/23/2017 04:40	WG1045909	
1,2-Dichloroethane	0.671	J	0.361	1.00	1	11/23/2017 04:40	WG1045909	
1,1-Dichloroethene	67.2		0.398	1.00	1	11/23/2017 04:40	WG1045909	
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/23/2017 04:40	WG1045909	
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/23/2017 04:40	WG1045909	
1,2-Dichloropropane	U		0.306	1.00	1	11/23/2017 04:40	WG1045909	
1,1-Dichloropropene	U		0.352	1.00	1	11/23/2017 04:40	WG1045909	
1,3-Dichloropropene	U		0.366	1.00	1	11/23/2017 04:40	WG1045909	
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/23/2017 04:40	WG1045909	
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/23/2017 04:40	WG1045909	
2,2-Dichloropropane	U		0.321	1.00	1	11/23/2017 04:40	WG1045909	
Di-isopropyl ether	U		0.320	1.00	1	11/23/2017 04:40	WG1045909	
Ethylbenzene	U		0.384	1.00	1	11/23/2017 04:40	WG1045909	
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/23/2017 04:40	WG1045909	
2-Hexanone	U		3.82	10.0	1	11/23/2017 04:40	WG1045909	
p-Isopropyltoluene	U		0.350	1.00	1	11/23/2017 04:40	WG1045909	
2-Butanone (MEK)	U		3.93	10.0	1	11/23/2017 04:40	WG1045909	
Methylene Chloride	U		1.00	5.00	1	11/23/2017 04:40	WG1045909	
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/23/2017 04:40	WG1045909	
Methyl tert-butyl ether	1.07		0.367	1.00	1	11/23/2017 04:40	WG1045909	
Naphthalene	U		1.00	5.00	1	11/23/2017 04:40	WG1045909	
Styrene	U		0.307	1.00	1	11/23/2017 04:40	WG1045909	
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/23/2017 04:40	WG1045909	
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/23/2017 04:40	WG1045909	
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 16:32	WG1045909	
Toluene	U		0.412	1.00	1	11/23/2017 04:40	WG1045909	
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/23/2017 04:40	WG1045909	
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/23/2017 04:40	WG1045909	
1,1,1-Trichloroethane	13.6		0.319	1.00	1	11/23/2017 04:40	WG1045909	
1,1,2-Trichloroethane	U		0.383	1.00	1	11/23/2017 04:40	WG1045909	
Trichloroethene	U		0.398	1.00	1	11/23/2017 04:40	WG1045909	
Trichlorofluoromethane	U		1.20	5.00	1	11/23/2017 04:40	WG1045909	
1,2,3-Trichloropropane	U		0.807	2.50	1	11/23/2017 04:40	WG1045909	
Vinyl chloride	U		0.259	1.00	1	11/23/2017 04:40	WG1045909	



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/23/2017 04:40	WG1045909	¹ Cp
o-Xylene	U		0.341	1.00	1	11/23/2017 04:40	WG1045909	² Tc
m&p-Xylene	U		0.719	2.00	1	11/23/2017 04:40	WG1045909	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/23/2017 04:40	WG1045909	
(S) Toluene-d8	105			80.0-120		11/28/2017 16:32	WG1045909	
(S) Toluene-d8	104			80.0-120		11/23/2017 04:40	WG1045909	
(S) Dibromofluoromethane	101			76.0-123		11/28/2017 16:32	WG1045909	
(S) Dibromofluoromethane	99.0			76.0-123		11/23/2017 04:40	WG1045909	
(S) 4-Bromofluorobenzene	102			80.0-120		11/23/2017 04:40	WG1045909	
(S) 4-Bromofluorobenzene	105			80.0-120		11/28/2017 16:32	WG1045909	

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	11/28/2017 13:55	WG1045961
Benzene	U		0.331	1.00	1	11/28/2017 13:55	WG1045961
Bromobenzene	U		0.352	1.00	1	11/28/2017 13:55	WG1045961
Bromochloromethane	U		0.520	5.00	1	11/28/2017 13:55	WG1045961
Bromodichloromethane	U		0.380	1.00	1	11/28/2017 13:55	WG1045961
Bromoform	U		0.469	1.00	1	11/28/2017 13:55	WG1045961
Bromomethane	U	J3	0.866	5.00	1	11/28/2017 13:55	WG1045961
Carbon tetrachloride	U		0.379	1.00	1	11/28/2017 13:55	WG1045961
Chlorobenzene	U		0.348	1.00	1	11/28/2017 13:55	WG1045961
Chlorodibromomethane	U		0.327	1.00	1	11/28/2017 13:55	WG1045961
Chloroethane	U		0.453	5.00	1	11/28/2017 13:55	WG1045961
Chloroform	U		0.324	5.00	1	11/28/2017 13:55	WG1045961
Chloromethane	U		0.276	2.50	1	11/28/2017 13:55	WG1045961
2-Chlorotoluene	U		0.375	1.00	1	11/28/2017 13:55	WG1045961
4-Chlorotoluene	U		0.351	1.00	1	11/28/2017 13:55	WG1045961
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/28/2017 13:55	WG1045961
1,2-Dibromoethane	U		0.381	1.00	1	11/28/2017 13:55	WG1045961
Dibromomethane	U		0.346	1.00	1	11/28/2017 13:55	WG1045961
1,2-Dichlorobenzene	U		0.349	1.00	1	11/28/2017 13:55	WG1045961
1,3-Dichlorobenzene	U		0.220	1.00	1	11/28/2017 13:55	WG1045961
1,4-Dichlorobenzene	U		0.274	1.00	1	11/28/2017 13:55	WG1045961
Dichlorodifluoromethane	U		0.551	5.00	1	11/28/2017 13:55	WG1045961
1,1-Dichloroethane	16.5		0.259	1.00	1	11/28/2017 13:55	WG1045961
1,2-Dichloroethane	0.819	J	0.361	1.00	1	11/28/2017 13:55	WG1045961
1,1-Dichloroethene	71.4		0.398	1.00	1	11/28/2017 13:55	WG1045961
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/28/2017 13:55	WG1045961
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/28/2017 13:55	WG1045961
1,2-Dichloropropane	U		0.306	1.00	1	11/28/2017 13:55	WG1045961
1,1-Dichloropropene	U		0.352	1.00	1	11/28/2017 13:55	WG1045961
1,3-Dichloropropene	U		0.366	1.00	1	11/28/2017 13:55	WG1045961
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/28/2017 13:55	WG1045961
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/28/2017 13:55	WG1045961
2,2-Dichloropropane	U		0.321	1.00	1	11/28/2017 13:55	WG1045961
Di-isopropyl ether	U		0.320	1.00	1	11/28/2017 13:55	WG1045961
Ethylbenzene	U		0.384	1.00	1	11/28/2017 13:55	WG1045961
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/28/2017 13:55	WG1045961
2-Hexanone	U		3.82	10.0	1	11/28/2017 13:55	WG1045961
p-Isopropyltoluene	U		0.350	1.00	1	11/28/2017 13:55	WG1045961
2-Butanone (MEK)	U		3.93	10.0	1	11/28/2017 13:55	WG1045961
Methylene Chloride	U		1.00	5.00	1	11/28/2017 13:55	WG1045961
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/28/2017 13:55	WG1045961
Methyl tert-butyl ether	1.17		0.367	1.00	1	11/28/2017 13:55	WG1045961
Naphthalene	U		1.00	5.00	1	11/28/2017 13:55	WG1045961
Styrene	U		0.307	1.00	1	11/28/2017 13:55	WG1045961
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/28/2017 13:55	WG1045961
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/28/2017 13:55	WG1045961
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 13:55	WG1045961
Toluene	U		0.412	1.00	1	11/28/2017 13:55	WG1045961
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/28/2017 13:55	WG1045961
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/28/2017 13:55	WG1045961
1,1,1-Trichloroethane	13.9		0.319	1.00	1	11/28/2017 13:55	WG1045961
1,1,2-Trichloroethane	U		0.383	1.00	1	11/28/2017 13:55	WG1045961
Trichloroethene	0.402	J	0.398	1.00	1	11/28/2017 13:55	WG1045961
Trichlorofluoromethane	U		1.20	5.00	1	11/28/2017 13:55	WG1045961
1,2,3-Trichloropropane	U		0.807	2.50	1	11/28/2017 13:55	WG1045961
Vinyl chloride	U		0.259	1.00	1	11/28/2017 13:55	WG1045961

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/28/2017 13:55	WG1045961	¹ Cp
o-Xylene	U		0.341	1.00	1	11/28/2017 13:55	WG1045961	² Tc
m&p-Xylene	U		0.719	2.00	1	11/28/2017 13:55	WG1045961	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/28/2017 13:55	WG1045961	
(S) Toluene-d8	95.3			80.0-120		11/28/2017 13:55	WG1045961	⁴ Cn
(S) Dibromofluoromethane	105			76.0-123		11/28/2017 13:55	WG1045961	⁵ Sr
(S) 4-Bromofluorobenzene	96.2			80.0-120		11/28/2017 13:55	WG1045961	⁶ Qc
								⁷ Gl
								⁸ Al
								⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	11/28/2017 13:16	WG1045961
Benzene	U		0.331	1.00	1	11/28/2017 13:16	WG1045961
Bromobenzene	U		0.352	1.00	1	11/28/2017 13:16	WG1045961
Bromochloromethane	U		0.520	5.00	1	11/28/2017 13:16	WG1045961
Bromodichloromethane	U		0.380	1.00	1	11/28/2017 13:16	WG1045961
Bromoform	U		0.469	1.00	1	11/28/2017 13:16	WG1045961
Bromomethane	U	J3	0.866	5.00	1	11/28/2017 13:16	WG1045961
Carbon tetrachloride	U		0.379	1.00	1	11/28/2017 13:16	WG1045961
Chlorobenzene	U		0.348	1.00	1	11/28/2017 13:16	WG1045961
Chlorodibromomethane	U		0.327	1.00	1	11/28/2017 13:16	WG1045961
Chloroethane	U		0.453	5.00	1	11/28/2017 13:16	WG1045961
Chloroform	U		0.324	5.00	1	11/28/2017 13:16	WG1045961
Chloromethane	U		0.276	2.50	1	11/28/2017 13:16	WG1045961
2-Chlorotoluene	U		0.375	1.00	1	11/28/2017 13:16	WG1045961
4-Chlorotoluene	U		0.351	1.00	1	11/28/2017 13:16	WG1045961
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	11/28/2017 13:16	WG1045961
1,2-Dibromoethane	U		0.381	1.00	1	11/28/2017 13:16	WG1045961
Dibromomethane	U		0.346	1.00	1	11/28/2017 13:16	WG1045961
1,2-Dichlorobenzene	U		0.349	1.00	1	11/28/2017 13:16	WG1045961
1,3-Dichlorobenzene	U		0.220	1.00	1	11/28/2017 13:16	WG1045961
1,4-Dichlorobenzene	U		0.274	1.00	1	11/28/2017 13:16	WG1045961
Dichlorodifluoromethane	U		0.551	5.00	1	11/28/2017 13:16	WG1045961
1,1-Dichloroethane	U		0.259	1.00	1	11/28/2017 13:16	WG1045961
1,2-Dichloroethane	U		0.361	1.00	1	11/28/2017 13:16	WG1045961
1,1-Dichloroethene	U		0.398	1.00	1	11/28/2017 13:16	WG1045961
cis-1,2-Dichloroethene	U		0.260	1.00	1	11/28/2017 13:16	WG1045961
trans-1,2-Dichloroethene	U		0.396	1.00	1	11/28/2017 13:16	WG1045961
1,2-Dichloropropane	U		0.306	1.00	1	11/28/2017 13:16	WG1045961
1,1-Dichloropropene	U		0.352	1.00	1	11/28/2017 13:16	WG1045961
1,3-Dichloropropane	U		0.366	1.00	1	11/28/2017 13:16	WG1045961
cis-1,3-Dichloropropene	U		0.418	1.00	1	11/28/2017 13:16	WG1045961
trans-1,3-Dichloropropene	U		0.419	1.00	1	11/28/2017 13:16	WG1045961
2,2-Dichloropropane	U		0.321	1.00	1	11/28/2017 13:16	WG1045961
Di-isopropyl ether	U		0.320	1.00	1	11/28/2017 13:16	WG1045961
Ethylbenzene	U		0.384	1.00	1	11/28/2017 13:16	WG1045961
Hexachloro-1,3-butadiene	U		0.256	1.00	1	11/28/2017 13:16	WG1045961
2-Hexanone	U		3.82	10.0	1	11/28/2017 13:16	WG1045961
p-Isopropyltoluene	U		0.350	1.00	1	11/28/2017 13:16	WG1045961
2-Butanone (MEK)	U		3.93	10.0	1	11/28/2017 13:16	WG1045961
Methylene Chloride	1.65	J	1.00	5.00	1	11/28/2017 13:16	WG1045961
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	11/28/2017 13:16	WG1045961
Methyl tert-butyl ether	U		0.367	1.00	1	11/28/2017 13:16	WG1045961
Naphthalene	U		1.00	5.00	1	11/28/2017 13:16	WG1045961
Styrene	U		0.307	1.00	1	11/28/2017 13:16	WG1045961
1,1,2-Tetrachloroethane	U		0.385	1.00	1	11/28/2017 13:16	WG1045961
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	11/28/2017 13:16	WG1045961
Tetrachloroethene	U		0.372	1.00	1	11/28/2017 13:16	WG1045961
Toluene	U		0.412	1.00	1	11/28/2017 13:16	WG1045961
1,2,3-Trichlorobenzene	U		0.230	1.00	1	11/28/2017 13:16	WG1045961
1,2,4-Trichlorobenzene	U		0.355	1.00	1	11/28/2017 13:16	WG1045961
1,1,1-Trichloroethane	U		0.319	1.00	1	11/28/2017 13:16	WG1045961
1,1,2-Trichloroethane	U		0.383	1.00	1	11/28/2017 13:16	WG1045961
Trichloroethene	U		0.398	1.00	1	11/28/2017 13:16	WG1045961
Trichlorofluoromethane	U		1.20	5.00	1	11/28/2017 13:16	WG1045961
1,2,3-Trichloropropane	U		0.807	2.50	1	11/28/2017 13:16	WG1045961
Vinyl chloride	U		0.259	1.00	1	11/28/2017 13:16	WG1045961

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch	
Vinyl acetate	U		1.63	10.0	1	11/28/2017 13:16	WG1045961	¹ Cp
o-Xylene	U		0.341	1.00	1	11/28/2017 13:16	WG1045961	² Tc
m&p-Xylene	U		0.719	2.00	1	11/28/2017 13:16	WG1045961	³ Ss
Xylenes, Total	U		1.06	3.00	1	11/28/2017 13:16	WG1045961	
(S) Toluene-d8	98.2			80.0-120		11/28/2017 13:16	WG1045961	⁴ Cn
(S) Dibromofluoromethane	103			76.0-123		11/28/2017 13:16	WG1045961	⁵ Sr
(S) 4-Bromofluorobenzene	97.9			80.0-120		11/28/2017 13:16	WG1045961	⁶ Qc
								⁷ Gl
								⁸ Al
								⁹ Sc

[L952655-01,02,03,04,05,06,07,08,09,10,11](#)

Method Blank (MB)

(MB) R3268721-2 11/22/17 20:59

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l	1 Cp
Acetone	U		10.0	50.0	
Benzene	U		0.331	1.00	
Bromobenzene	U		0.352	1.00	
Bromodichloromethane	U		0.380	1.00	
Bromochloromethane	U		0.520	5.00	
Bromoform	U		0.469	1.00	
Bromomethane	U		0.866	5.00	
Carbon tetrachloride	U		0.379	1.00	
Chlorobenzene	U		0.348	1.00	
Chlorodibromomethane	U		0.327	1.00	
Chloroethane	U		0.453	5.00	
Chloroform	U		0.324	5.00	
Chloromethane	U		0.276	2.50	
2-Chlorotoluene	U		0.375	1.00	
4-Chlorotoluene	U		0.351	1.00	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	
1,2-Dibromoethane	U		0.381	1.00	
Dibromomethane	U		0.346	1.00	
1,2-Dichlorobenzene	U		0.349	1.00	
1,3-Dichlorobenzene	U		0.220	1.00	
1,4-Dichlorobenzene	U		0.274	1.00	
Dichlorodifluoromethane	U		0.551	5.00	
1,1-Dichloroethane	U		0.259	1.00	
1,2-Dichloroethane	U		0.361	1.00	
1,1-Dichloroethene	U		0.398	1.00	
cis-1,2-Dichloroethene	U		0.260	1.00	
trans-1,2-Dichloroethene	U		0.396	1.00	
1,2-Dichloropropane	U		0.306	1.00	
1,1-Dichloropropene	U		0.352	1.00	
1,3-Dichloropropane	U		0.366	1.00	
cis-1,3-Dichloropropene	U		0.418	1.00	
trans-1,3-Dichloropropene	U		0.419	1.00	
2,2-Dichloropropane	U		0.321	1.00	
Di-isopropyl ether	U		0.320	1.00	
Ethylbenzene	U		0.384	1.00	
Hexachloro-1,3-butadiene	0.496	J	0.256	1.00	
2-Hexanone	U		3.82	10.0	
p-Isopropyltoluene	U		0.350	1.00	
2-Butanone (MEK)	U		3.93	10.0	
Methylene Chloride	U		1.00	5.00	

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[L952655-01,02,03,04,05,06,07,08,09,10,11](#)

Method Blank (MB)

(MB) R3268721-2 11/22/17 20:59

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0
Methyl tert-butyl ether	U		0.367	1.00
Naphthalene	U		1.00	5.00
Styrene	U		0.307	1.00
1,1,2-Tetrachloroethane	U		0.385	1.00
1,1,2,2-Tetrachloroethane	U		0.130	1.00
Tetrachloroethene	U		0.372	1.00
Toluene	U		0.412	1.00
1,2,3-Trichlorobenzene	0.266	J	0.230	1.00
1,2,4-Trichlorobenzene	U		0.355	1.00
1,1,1-Trichloroethane	U		0.319	1.00
1,1,2-Trichloroethane	U		0.383	1.00
Trichloroethene	U		0.398	1.00
Trichlorofluoromethane	U		1.20	5.00
1,2,3-Trichloropropane	U		0.807	2.50
Vinyl acetate	U		1.63	10.0
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
o-Xylene	U		0.341	1.00
m&p-Xylenes	U		0.719	2.00
(S) Toluene-d8	106		80.0-120	
(S) Dibromofluoromethane	100		76.0-123	
(S) 4-Bromofluorobenzene	105		80.0-120	

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3268721-1 11/22/17 20:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	125	141	113	10.0-160	
Benzene	25.0	24.9	99.6	69.0-123	
Bromobenzene	25.0	24.0	96.1	79.0-120	
Bromodichloromethane	25.0	25.0	100	76.0-120	
Bromochloromethane	25.0	25.9	103	76.0-122	
Bromoform	25.0	25.9	104	67.0-132	
Bromomethane	25.0	24.1	96.4	18.0-160	
Carbon tetrachloride	25.0	24.9	99.8	63.0-122	
Chlorobenzene	25.0	25.8	103	79.0-121	
Chlorodibromomethane	25.0	25.8	103	75.0-125	

[L952655-01,02,03,04,05,06,07,08,09,10,11](#)

Laboratory Control Sample (LCS)

(LCS) R3268721-1 11/22/17 20:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Chloroethane	25.0	24.3	97.2	47.0-152	¹ Cp
Chloroform	25.0	25.6	102	72.0-121	² Tc
Chloromethane	25.0	25.3	101	48.0-139	³ Ss
2-Chlorotoluene	25.0	25.3	101	74.0-122	⁴ Cn
4-Chlorotoluene	25.0	25.8	103	79.0-120	⁵ Sr
1,2-Dibromo-3-Chloropropane	25.0	25.8	103	64.0-127	⁶ Qc
1,2-Dibromoethane	25.0	26.0	104	77.0-123	⁷ Gl
Dibromomethane	25.0	25.4	102	78.0-120	⁸ Al
1,2-Dichlorobenzene	25.0	25.4	102	80.0-120	⁹ Sc
1,3-Dichlorobenzene	25.0	25.1	100	72.0-123	
1,4-Dichlorobenzene	25.0	24.7	98.7	77.0-120	
Dichlorodifluoromethane	25.0	30.3	121	49.0-155	
1,1-Dichloroethane	25.0	24.7	98.7	70.0-126	
1,2-Dichloroethane	25.0	24.4	97.6	67.0-126	
1,1-Dichloroethene	25.0	27.6	111	64.0-129	
cis-1,2-Dichloroethene	25.0	24.9	99.7	73.0-120	
trans-1,2-Dichloroethene	25.0	26.2	105	71.0-121	
1,2-Dichloropropane	25.0	25.8	103	75.0-125	
1,1-Dichloropropene	25.0	26.3	105	71.0-129	
1,3-Dichloropropane	25.0	25.2	101	80.0-121	
cis-1,3-Dichloropropene	25.0	25.4	102	79.0-123	
trans-1,3-Dichloropropene	25.0	25.4	102	74.0-127	
2,2-Dichloropropane	25.0	25.2	101	60.0-125	
Di-isopropyl ether	25.0	24.1	96.2	59.0-133	
Ethylbenzene	25.0	26.6	106	77.0-120	
Hexachloro-1,3-butadiene	25.0	25.9	104	64.0-131	
2-Hexanone	125	141	113	58.0-147	
p-Isopropyltoluene	25.0	26.5	106	74.0-126	
2-Butanone (MEK)	125	117	93.3	37.0-158	
Methylene Chloride	25.0	23.2	92.7	66.0-121	
4-Methyl-2-pentanone (MIBK)	125	131	105	59.0-143	
Methyl tert-butyl ether	25.0	24.4	97.5	64.0-123	
Naphthalene	25.0	26.8	107	62.0-128	
Styrene	25.0	26.3	105	78.0-124	
1,1,1,2-Tetrachloroethane	25.0	26.1	104	75.0-122	
1,1,2,2-Tetrachloroethane	25.0	24.9	99.8	71.0-122	
Tetrachloroethene	25.0	26.4	106	70.0-127	
Toluene	25.0	25.1	100	77.0-120	
1,2,3-Trichlorobenzene	25.0	23.3	93.4	61.0-133	
1,2,4-Trichlorobenzene	25.0	25.3	101	69.0-129	

[L952655-01,02,03,04,05,06,07,08,09,10,11](#)

Laboratory Control Sample (LCS)

(LCS) R3268721-1 11/22/17 20:19

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
1,1,1-Trichloroethane	25.0	27.2	109	68.0-122	¹ Cp
1,1,2-Trichloroethane	25.0	25.5	102	78.0-120	² Tc
Trichloroethene	25.0	27.2	109	78.0-120	³ Ss
Trichlorofluoromethane	25.0	24.7	98.8	56.0-137	⁴ Cn
1,2,3-Trichloropropane	25.0	24.8	99.2	72.0-124	⁵ Sr
Vinyl acetate	125	127	102	46.0-160	⁶ Qc
Vinyl chloride	25.0	27.1	108	64.0-133	⁷ Gl
Xylenes, Total	75.0	80.5	107	77.0-120	⁸ Al
o-Xylene	25.0	26.8	107	78.0-120	⁹ Sc
m&p-Xylenes	50.0	53.7	107	77.0-120	
(S) Toluene-d8		103		80.0-120	
(S) Dibromofluoromethane		99.5		76.0-123	
(S) 4-Bromofluorobenzene		104		80.0-120	



L952655-12,13

Method Blank (MB)

(MB) R3268920-3 11/28/17 12:38

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l	
Acetone	U		10.0	50.0	¹ Cp
Benzene	U		0.331	1.00	² Tc
Bromobenzene	U		0.352	1.00	³ Ss
Bromodichloromethane	U		0.380	1.00	⁴ Cn
Bromochloromethane	U		0.520	5.00	⁵ Sr
Bromoform	U		0.469	1.00	⁶ Qc
Bromomethane	U		0.866	5.00	⁷ Gl
Carbon tetrachloride	U		0.379	1.00	⁸ Al
Chlorobenzene	U		0.348	1.00	⁹ Sc
Chlorodibromomethane	U		0.327	1.00	
Chloroethane	U		0.453	5.00	
Chloroform	U		0.324	5.00	
Chloromethane	U		0.276	2.50	
2-Chlorotoluene	U		0.375	1.00	
4-Chlorotoluene	U		0.351	1.00	
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	
1,2-Dibromoethane	U		0.381	1.00	
Dibromomethane	U		0.346	1.00	
1,2-Dichlorobenzene	U		0.349	1.00	
1,3-Dichlorobenzene	U		0.220	1.00	
1,4-Dichlorobenzene	U		0.274	1.00	
Dichlorodifluoromethane	U		0.551	5.00	
1,1-Dichloroethane	U		0.259	1.00	
1,2-Dichloroethane	U		0.361	1.00	
1,1-Dichloroethene	U		0.398	1.00	
cis-1,2-Dichloroethene	U		0.260	1.00	
trans-1,2-Dichloroethene	U		0.396	1.00	
1,2-Dichloropropane	U		0.306	1.00	
1,1-Dichloropropene	U		0.352	1.00	
1,3-Dichloropropane	U		0.366	1.00	
cis-1,3-Dichloropropene	U		0.418	1.00	
trans-1,3-Dichloropropene	U		0.419	1.00	
2,2-Dichloropropane	U		0.321	1.00	
Di-isopropyl ether	U		0.320	1.00	
Ethylbenzene	U		0.384	1.00	
Hexachloro-1,3-butadiene	U		0.256	1.00	
2-Hexanone	U		3.82	10.0	
p-Isopropyltoluene	U		0.350	1.00	
2-Butanone (MEK)	U		3.93	10.0	
Methylene Chloride	U		1.00	5.00	

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[L952655-12,13](#)

Method Blank (MB)

(MB) R3268920-3 11/28/17 12:38

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l	¹ Cp
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	² Tc
Methyl tert-butyl ether	U		0.367	1.00	³ Ss
Naphthalene	U		1.00	5.00	⁴ Cn
Styrene	U		0.307	1.00	⁵ Sr
1,1,2-Tetrachloroethane	U		0.385	1.00	⁶ Qc
1,1,2,2-Tetrachloroethane	U		0.130	1.00	⁷ Gl
Tetrachloroethene	U		0.372	1.00	⁸ Al
Toluene	U		0.412	1.00	⁹ Sc
1,2,3-Trichlorobenzene	U		0.230	1.00	
1,2,4-Trichlorobenzene	U		0.355	1.00	
1,1,1-Trichloroethane	U		0.319	1.00	
1,1,2-Trichloroethane	U		0.383	1.00	
Trichloroethene	U		0.398	1.00	
Trichlorofluoromethane	U		1.20	5.00	
1,2,3-Trichloropropane	U		0.807	2.50	
Vinyl acetate	U		1.63	10.0	
Vinyl chloride	U		0.259	1.00	
Xylenes, Total	U		1.06	3.00	
o-Xylene	U		0.341	1.00	
m&p-Xylenes	U		0.719	2.00	
(S) Toluene-d8	98.6		80.0-120		
(S) Dibromofluoromethane	102		76.0-123		
(S) 4-Bromofluorobenzene	98.7		80.0-120		

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3268920-1 11/28/17 11:40 • (LCSD) R3268920-2 11/28/17 11:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Acetone	125	158	146	126	117	10.0-160			7.63	23
Benzene	25.0	24.5	25.3	97.8	101	69.0-123			3.37	20
Bromobenzene	25.0	21.8	22.5	87.2	90.0	79.0-120			3.11	20
Bromodichloromethane	25.0	24.1	24.6	96.4	98.4	76.0-120			2.04	20
Bromoform	25.0	24.8	25.5	99.2	102	67.0-132			2.74	20
Bromomethane	25.0	14.5	18.7	58.1	74.8	18.0-160	J3		25.1	20
Carbon tetrachloride	25.0	26.7	26.4	107	105	63.0-122			1.36	20
Chlorobenzene	25.0	23.5	23.9	94.0	95.4	79.0-121			1.54	20
Chlorodibromomethane	25.0	25.3	26.4	101	106	75.0-125			4.53	20



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3268920-1 11/28/17 11:40 • (LCSD) R3268920-2 11/28/17 11:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %	1 Cp
Chloroethane	25.0	28.0	28.5	112	114	47.0-152			1.51	20	2 Tc
Chloroform	25.0	24.1	24.9	96.3	99.7	72.0-121			3.47	20	3 Ss
Chloromethane	25.0	19.5	20.9	77.8	83.6	48.0-139			7.17	20	4 Cn
2-Chlorotoluene	25.0	22.5	23.5	90.0	93.9	74.0-122			4.29	20	5 Sr
4-Chlorotoluene	25.0	22.2	22.8	89.0	91.1	79.0-120			2.33	20	6 Qc
1,2-Dibromo-3-Chloropropane	25.0	23.1	24.5	92.2	97.8	64.0-127			5.88	20	7 Gl
1,2-Dibromoethane	25.0	24.0	24.7	95.9	98.7	77.0-123			2.85	20	8 Al
Dibromomethane	25.0	25.7	25.6	103	103	78.0-120			0.212	20	9 Sc
1,2-Dichlorobenzene	25.0	23.6	24.1	94.4	96.3	80.0-120			1.97	20	
1,3-Dichlorobenzene	25.0	22.4	23.2	89.4	92.8	72.0-123			3.78	20	
1,4-Dichlorobenzene	25.0	22.6	23.3	90.2	93.2	77.0-120			3.30	20	
Dichlorodifluoromethane	25.0	23.4	23.8	93.5	95.4	49.0-155			2.01	20	
1,1-Dichloroethane	25.0	27.2	27.8	109	111	70.0-126			1.98	20	
1,2-Dichloroethane	25.0	26.6	27.1	107	108	67.0-126			1.73	20	
1,1-Dichloroethene	25.0	27.3	27.7	109	111	64.0-129			1.48	20	
cis-1,2-Dichloroethene	25.0	24.5	24.8	97.8	99.1	73.0-120			1.23	20	
trans-1,2-Dichloroethene	25.0	23.8	24.8	95.0	99.4	71.0-121			4.49	20	
1,2-Dichloropropane	25.0	26.3	26.4	105	106	75.0-125			0.572	20	
1,1-Dichloropropene	25.0	24.4	24.9	97.5	99.6	71.0-129			2.12	20	
1,3-Dichloropropane	25.0	24.0	24.8	96.2	99.3	80.0-121			3.24	20	
cis-1,3-Dichloropropene	25.0	23.4	24.1	93.6	96.2	79.0-123			2.80	20	
trans-1,3-Dichloropropene	25.0	24.9	25.2	99.5	101	74.0-127			1.52	20	
2,2-Dichloropropane	25.0	23.8	23.7	95.1	94.7	60.0-125			0.422	20	
Di-isopropyl ether	25.0	27.2	27.8	109	111	59.0-133			2.10	20	
Ethylbenzene	25.0	24.0	25.0	96.2	100	77.0-120			3.93	20	
Hexachloro-1,3-butadiene	25.0	24.8	26.2	99.1	105	64.0-131			5.51	20	
2-Hexanone	125	151	151	121	121	58.0-147			0.0131	20	
p-Isopropyltoluene	25.0	23.2	24.0	92.7	95.8	74.0-126			3.39	20	
2-Butanone (MEK)	125	156	155	125	124	37.0-158			0.888	20	
Methylene Chloride	25.0	23.8	23.8	95.1	95.1	66.0-121			0.0134	20	
4-Methyl-2-pentanone (MIBK)	125	138	142	111	114	59.0-143			2.87	20	
Methyl tert-butyl ether	25.0	24.9	25.6	99.7	102	64.0-123			2.71	20	
Naphthalene	25.0	23.5	24.7	93.9	98.9	62.0-128			5.13	20	
Styrene	25.0	22.9	23.6	91.6	94.4	78.0-124			3.01	20	
1,1,2-Tetrachloroethane	25.0	24.7	25.6	98.9	102	75.0-122			3.58	20	
1,1,2,2-Tetrachloroethane	25.0	24.0	24.4	95.9	97.5	71.0-122			1.65	20	
Tetrachloroethene	25.0	24.0	24.5	96.1	98.1	70.0-127			2.08	20	
Toluene	25.0	22.4	23.2	89.5	92.9	77.0-120			3.71	20	
1,2,3-Trichlorobenzene	25.0	24.3	25.5	97.3	102	61.0-133			4.64	20	
1,2,4-Trichlorobenzene	25.0	24.4	26.1	97.7	104	69.0-129			6.48	20	



Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3268920-1 11/28/17 11:40 • (LCSD) R3268920-2 11/28/17 11:59

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
1,1,1-Trichloroethane	25.0	24.6	25.6	98.4	102	68.0-122			3.97	20
1,1,2-Trichloroethane	25.0	23.1	24.1	92.3	96.5	78.0-120			4.48	20
Trichloroethylene	25.0	24.5	24.9	98.1	99.7	78.0-120			1.57	20
Trichlorofluoromethane	25.0	27.2	28.4	109	114	56.0-137			4.39	20
1,2,3-Trichloropropane	25.0	24.5	24.9	98.0	99.5	72.0-124			1.58	20
Vinyl acetate	125	154	155	123	124	46.0-160			0.795	20
Vinyl chloride	25.0	25.6	26.6	103	106	64.0-133			3.75	20
Xylenes, Total	75.0	71.0	72.5	94.7	96.7	77.0-120			2.09	20
o-Xylene	25.0	23.5	23.7	94.1	95.0	78.0-120			0.881	20
m&p-Xylenes	50.0	47.5	48.8	95.0	97.7	77.0-120			2.77	20
(S) Toluene-d8				95.7	97.2	80.0-120				
(S) Dibromofluoromethane				102	102	76.0-123				
(S) 4-Bromofluorobenzene				94.5	95.7	80.0-120				

¹Cp²Tc³Ss⁴Cn⁵Sr⁶Qc⁷Gl⁸Al⁹Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.	¹ Cp
RDL	Reported Detection Limit.	² Tc
Rec.	Recovery.	³ Ss
RPD	Relative Percent Difference.	⁴ Cn
SDG	Sample Delivery Group.	⁵ Sr
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.	⁶ Qc
U	Not detected at the Reporting Limit (or MDL where applicable).	⁷ Gl
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.	⁸ Al
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.	⁹ Sc
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.	
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.	
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.	
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.	
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.	
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.	
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.	
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.	

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey—NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio—VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

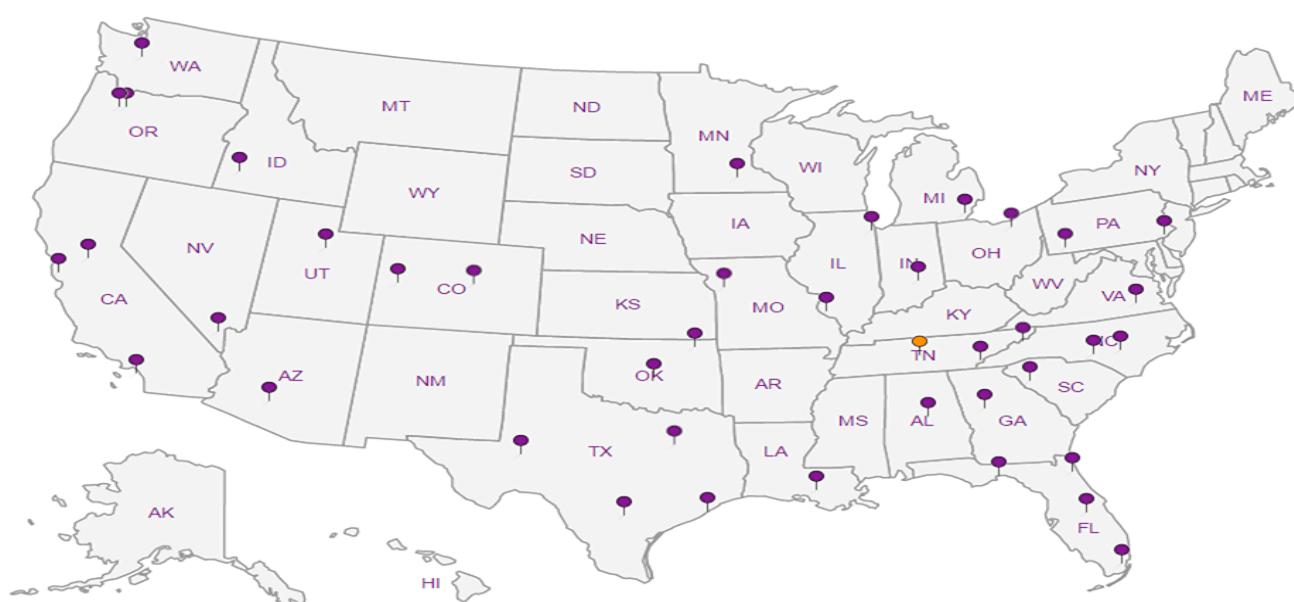
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ GI
- ⁸ Al
- ⁹ Sc

Chain of Custody

C148



Workorder: 92363693

Workorder Name: KOPFLEX- ONSITE

Results Requested By: 11/27/2017

L95Z655

Report / Invoice To		Subcontract To		Requested Analysis											
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	HDL	Preserved Containers									LAB USE ONLY
1	MW-2400	11/14/2017 09:30	92363693001	Water		X									-01
2	MW-24D	11/14/2017 09:45	92363693002	Water		X									-02
3	MW-33D275	11/14/2017 10:48	92363693003	Water		X									-03
4	MW-33D295	11/14/2017 10:55	92363693004	Water		X									-04
5	MW-28	11/14/2017 11:30	92363693005	Water		X									-05
6	MW-28D	11/14/2017 11:40	92363693006	Water		X									-06
7	MW-35D	11/14/2017 12:00	92363693007	Water		X									-07
8	MW-31D	11/14/2017 13:15	92363693008	Water		X									-08
9	MW-25	11/14/2017 15:25	92363693009	Water		X									-09
10	MW-25D-130	11/14/2017 15:52	92363693010	Water		X									-10
11	MW-25D-190	11/14/2017 15:33	92363693011	Water		X									-11
12	MW-2500	11/14/2017 15:30	92363693012	Water		X									-12
13	TB-111417	11/14/2017 00:00	92363693013	Water		X									-13
14															
15															
16															
17															

Tracking #: 7458
98344852

Kelly New 841
11/21/17 0845 2.5 mls

L952055

Transfers	Released By	Date/Time	Received By	Date/Time	Comments	
					* SEE ATTACHED LIST + LIMITS	
1	Chaco-Ahu	11/20/17 18:00	Kelly Mersch	11/21/17 00:04		
2						
3						
Cooler Temperature on Receipt	°C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact Y or N

Tracking #: 7458 9834 4882

25 mg/L
SD

Sample Receipt Form

Pace Analytical Services, LLC
Charlotte

Pace Analytical®
www.paceanalytical.com

Sample Acknowledgement Recipients:

WSP USA
Eric Johnson
13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171
Email: eric.johnson@wsp.com

Bill to:

WSP USA
Eric Johnson
13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171
Email: eric.johnson@wsp.com

Final Report Recipients:

WSP USA
Eric Johnson (Primary)
13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171
Email: eric.johnson@wsp.com

Line Item Descriptions:
[1] 1,4-Dioxane

Client P O No: _____
Phone: (704)875-9092
Project Manager: Taylor Ezell
Client Project ID: KOPFLEX-ONSITE

Automated EDD

EDD #: ERIMS for WSP (57)

Publish or Review?: Publish (P)

Email Client?: Yes (Y)

Include FR?: Yes (Y)

Auto Invoice: No, do not auto invoice (N)

Email Invoice?: No, do not auto email (N)

Print Final Invoice?: Yes, print invoice (Y)

Multiple EDD #2: FR Only no EDD (0)

Multiple EDD #3: FR Only no EDD (0)

Multiple EDD #4: FR Only no EDD (0)

Multiple EDD #5: FR Only no EDD (0)

Lab Smp ID: 92363693001
Proj Smp No: 1

PARAMETER
8260 VLL - 8260 MS Volatiles

COMPOUND	PQL	UNITS	
Acetone	1	ug/L	25 ug/L
Benzene	1	ug/L	1 ug/L
Bromobenzene	1	ug/L	1 ug/L
Bromoform	1	ug/L	1 ug/L
Bromomethane	2	ug/L	1 ug/L
2-Butanone (MEK)	5	ug/L	5 ug/L
Chloroethane	1	ug/L	1 ug/L
Chlorobenzene	1	ug/L	1 ug/L
Chloroform	1	ug/L	1 ug/L
Chloromethane	1	ug/L	1 ug/L
2-Chlorotoluene	1	ug/L	1 ug/L
4-Chlorotoluene	2	ug/L	1 ug/L
1,2-Dibromo-3-chloropropane	1	ug/L	2 ug/L
Dibromochloromethane	1	ug/L	1 ug/L
1,2-Dibromoethane (EDB)	1	ug/L	1 ug/L

Line Item ID:	MW-2400	Smp Type: PS	Line Item: 1	Collected Date: 11/14/17 09:30	Received Date: 11/16/17 09:40
PARAMETER	METHOD		EARLIEST HOLD	UNIT PRICE	WR
8260 VLL - 8260 MS Volatiles	EPA 8260		11/26/17 23:59	\$65.00	

L952655

Sample Receipt Form

Pace Analytical Services, LLC

Charlotte



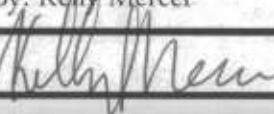
www.paceanalytical.com

PARAMETER	COMPOUND	PQL	UNITS	METHOD	EARLIEST HOLD	UNIT PRICE	WR	SPL	%
	Dibromomethane	1	ug/L						
	1,2-Dichlorobenzene	1	ug/L						
	1,3-Dichlorobenzene	1	ug/L						
	1,4-Dichlorobenzene	1	ug/L						
	Dichlorodifluoromethane	1	ug/L						
	1,1-Dichloroethane	1	ug/L						
	1,2-Dichloroethane	1	ug/L						
	1,1-Dichloroethene	1	ug/L						
	cis-1,2-Dichloroethene	1	ug/L						
	trans-1,2-Dichloroethene	1	ug/L						
	1,2-Dichloropropane	1	ug/L						
	1,3-Dichloropropane	1	ug/L						
	2,2-Dichloropropane	1	ug/L						
	1,1-Dichloropropene	1	ug/L						
	cis-1,3-Dichloropropene	1	ug/L						
	trans-1,3-Dichloropropene	1	ug/L						
	Diisopropyl ether	1	ug/L						
	Ethylbenzene	1	ug/L						
	Hexachloro-1,3-butadiene	1	ug/L						
	2-Hexanone	5	ug/L						
	p-Isopropyltoluene	1	ug/L						
	Methylene Chloride	2	ug/L						
	4-Methyl-2-pentanone (MIBK)	5	ug/L						
	Methyl-Tert-butyl ether	1	ug/L						
	Naphthalene	1	ug/L						
	Styrene	1	ug/L						
	1,1,1,2-Tetrachloroethane	1	ug/L						
	1,1,2,2-Tetrachloroethane	1	ug/L						
	Tetrachloroethene	1	ug/L						
	Toluene	1	ug/L						
	1,2,3-Trichlorobenzene	1	ug/L						
	1,2,4-Trichlorobenzene	1	ug/L						
	1,1,1-Trichloroethane	1	ug/L						
	1,1,2-Trichloroethane	1	ug/L						
	Trichloroethene	1	ug/L						
	Trichlorofluoromethane	1	ug/L						
	1,2,3-Trichloropropane	1	ug/L						
	Vinyl acetate	2	ug/L						
	Vinyl chloride	1	ug/L						
	Xylene (Total)	1	ug/L						
	m&p-Xylene	2	ug/L						
	o-Xylene	1	ug/L						
8260 WSIM - 8260 MSV				EPA 8260B Mod.	11/28/17 23:59	\$125.00			
				Sub Total - Sample 2147342		\$190.00			

Lab Smp ID:	92363693002	Client Smp ID:	MW-24D	Line Item: PS	Method	EARLIEST HOLD	UNIT PRICE	WR	SPL	%
Proj Smp No:	2	Matrix:	Water							
<hr/>										
PARAMETER										
8260 WLL - 8260 MS Volatiles			EPA 8260		11/28/17 23:59		\$65.00			
Compound Count:	60									
8260 WSIM - 8260 MSV			EPA 8260B Mod.		11/28/17 23:59		\$125.00			

L952655

ESC LAB SCIENCES
Cooler Receipt Form

Client: PACE	SDG#	9521055	
Cooler Received/Opened On: 11/21/17	Temperature:	2.5	
Received By: Kelly Mercer			
Signature: 			
Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?			
Bottles arrive intact?			
Correct bottles used?			
Sufficient volume sent?			
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Katie Ingram

From: Nancy McLain
Sent: Tuesday, November 21, 2017 3:18 PM
To: Login; Shipping
Subject: PACE -Huntersville NC samples
Importance: High

PACE (Huntersville, NC) says they sent us too many vials for 8260 analysis. These haven't been logged yet. They need two or three vials for each of these work orders sent back to them. If by chance they're mistaken and didn't send an extra 2-3 to spare and send back please let me know.

92363686
92363691
92363838

The WO number is on the COC.

Shipping: Please ship back to here:

Pace Analytical Services, Inc.-Carolina Labs
Attn: Taylor Ezell
9800 Kincel Ave
Suite 100
Huntersville, NC 28078

Thanks,
Nancy