VIA ELECTRONIC MAIL

November 02, 2017

Erich Weissbart, P.G.
Remedial Project Manager
Land and Chemicals Division
U.S. Environmental Protection Agency, Region III
701 Mapes Road
Fort Meade, MD 20755

Subject: **Quarterly Progress Report No. 4**
Former Kop-Flex Facility Site, Hanover, Maryland
Administrative Order on Consent, Docket No. RCRA-03-2016-0170 CA

Dear Erich:

On behalf of EMERSUB 16, LLC, a subsidiary of Emerson Electric Co., WSP USA, Inc. (WSP) is submitting this quarterly progress report describing the remedial and groundwater monitoring activities conducted in the third quarter of calendar year 2017 (July 1 through September 30) as part of the corrective measures implementation at the former Kop-Flex, Inc. facility property located at 7555 and 7565 Harmans Road (Site) in Hanover, Maryland. The Site is identical to the area described as the "Facility" in the Administrative Order on Consent, Docket No. RCRA-03-2016-0170 CA for the Site (Consent Order). The report also describes the activities planned for the fourth quarter of calendar year 2017 (October 1 through December 31). This progress report is being submitted to the U.S. Environmental Protection Agency (EPA) pursuant to Section IV.C.3 of the Consent Order.

This submittal also fulfills the quarterly operation, maintenance and monitoring (OM&M) reporting requirement for the onsite groundwater remedial system specified in Section 14.2 of the October 2015 Response Action Plan (RAP). The inclusion of information pertaining to the system OM&M in this progress report was approved by the Maryland Department of the Environment (MDE) in an October 10, 2017, email communication, in which EPA was included as a recipient. Please note that EMERSUB 16 continues to fulfill its obligations under the October 2015 RAP approved by the MDE Voluntary Cleanup Program, and that EMERSUB 16 copies EPA on all submittals required under that program.

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

Kind regards,

Robert E. Johnson, PhD.
Senior Technical Manager

REJ:rlo
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WSP USA
Suite 300
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Herndon, VA 20171

Tel.: +1 703 709-6500
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Encl.

cc: Mr. Stephen Clarke, Emerson Electric Co.
Ms. Richelle Hanson, Maryland Department of the Environment
Mr. Raymond Goins, Trammell Crow Company

CERTIFICATION

I certify that the information contained in or accompanying this quarterly progress report is true, accurate, and complete.

As to those portions of this quarterly progress report for which I cannot personally verify their accuracy, I certify under penalty of law that this quarterly report and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: 

Name: Stephen L. Clarke

Title: President of EMERSUB 16, LLC

Quarterly Progress Report No. 4

Former Kop-Flex Facility Site

July 2017 through September 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
Alternate:	Lisa Bryda

1.0 ACTIVITIES COMPLETED DURING JULY 2017 – SEPTEMBER 2017 REPORTING PERIOD

1.1 HYDRAULIC CONTAINMENT SYSTEM OPERATION

— The hydraulic containment system operated continuously from July 1, 2017 through September 30, 2017. During the reporting period, a total of approximately 8.25 million gallons of volatile organic compound (VOC)-containing groundwater was recovered and treated by the system, with a combined average withdrawal rate of approximately 62.3 gallons per minute (GPM) from the shallow and deep recovery wells. During system operation, water samples were periodically collected for chemical analysis to monitor and evaluate VOC concentrations in the influent and effluent for the treatment system. Total concentrations of VOCs (including 1,4-dioxane) for the system influent ranged from 480 micrograms per liter (µg/l) to 529 µg/l, with the levels exhibiting a small but consistent decrease during the reporting period. Analysis of the treated water samples indicated non-detect concentrations of chlorinated VOCs, and non-detect to very low concentrations of 1,4-dioxane. Additional information concerning the system performance is provided in the Operation and Maintenance (O&M) Report included in Enclosure A.

— In conjunction with the system operation, samples of the treated effluent were collected for chemical analysis in accordance with State Discharge Permit Number 15-DP-3442 and National Pollutant Discharge Elimination System (NPDES) Permit MD 0069094 (Permit) issued by the Maryland Department of Environment (MDE). The analytical results indicate compliance with the effluent limitations specified in the Permit. Additionally, Whole Effluent Toxicity (WET) testing of the treated effluent was conducted in accordance with the revised Biomonitoring Study Plan. The second quarterly biomonitoring event was completed in mid-September 2017. Evaluation of the test results with respect to information provided by the MDE Water Management Administration indicates no adverse toxicity associated with the treated water discharge. Additional information concerning the system monitoring is provided in the O&M Report included in Enclosure A.

1.2 GROUNDWATER LEVEL MONITORING

— Quarterly groundwater level monitoring is conducted to gather data to evaluate the hydraulic response to remedial pumping in both the unconfined and confined portions of the aquifer system. During the reporting period, water level measurements were collected from the monitoring wells and recovery well piezometers the week of August 28, 2017. The data for this and previous measurement rounds from December 2016 to the present are provided in Table 1.

— Water level contour maps depicting hydraulic head conditions in the shallow, unconfined zone after 5 months of continuous groundwater withdrawal are provided in Figures 1 and 2. The water table contour map (Figure 1) indicates a slight localized depression in the groundwater surface around well MW-38R in response to groundwater extraction. The most pronounced head changes (i.e., drawdown) occurred within the permeable sand deposits comprising the lower portion of the unconfined zone, with a well-developed cone of depression centered around the shallow recovery wells and extending in the downgradient direction toward monitoring wells MW-39 and MW-43. (Figure 2). Based on the spatial head variations, VOC-

containing groundwater in the upper portion of the unconfined zone will tend to migrate downward through the clayey deposits as flow paths move toward the recovery wells. This downward seepage would mix with VOCs migrating through the predominately sand deposits in the lower portion of the shallow zone and be captured as part of the inflow to the recovery wells, particularly RW-1S and RW-2S. The groundwater capture area for the shallow recovery well system encompasses the width of the downgradient portion of the VOC plume as defined by the baseline sampling data from monitoring wells MW-44, MW-18, and MW-43.

— A potentiometric surface contour map for the confined portion of the Lower Patapsco aquifer is provided in Figure 3. The head distribution shows the creation of a well-developed but somewhat localized hydraulic sink along the southern property boundary in the area around deep recovery well RW-2D, with a less pronounced decline in the potentiometric surface in the vicinity of RW-1D. The interpolated shape of the potentiometric surface exhibits minor differences compared to contour maps generated during the initial months of system operation. The observed changes reflect a slight reduction in the pumping rates for both deep wells, which is related to a decrease in the specific capacity, or yield per foot of drawdown. Based on the inferred flow paths in response to the reduced pumping rates, the groundwater inflow area for the deep recovery wells may not fully capture the western-most portion of the VOC plume in the confined portion of the Lower Patapsco aquifer. Upon review of the hydrogeologic data, WSP immediately increased the pumping rate for RW-1D to expand the groundwater inflow area for the deep wells and ensure containment of the VOC-containing groundwater at the southern property boundary.

1.3 GROUNDWATER QUALITY MONITORING

— In accordance with the Groundwater Monitoring Plan, quarterly groundwater quality samples were collected from the shallow and deep recovery wells during the week of August 28, 2017. These well samples were collected directly from an in-line sampling port located at each well-head prior to the water entering the sub-grade conveyance piping and being routed to the treatment system. The samples were submitted to Pace Analytical Services laboratory in Huntersville, North Carolina, and analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using modified USEPA Method 8260B with selective ion monitoring. The VOC analytical results for the August 2017 recovery well samples are summarized in Table 2. A copy of the certified laboratory analytical report for the samples is included in Enclosure B.

— For the shallow (unconfined) zone, total concentrations of chlorinated VOCs + 1,4-dioxane were above 1 milligram per liter in the RW-1S and RW-2S samples (Figure 4). The total VOC + 1,4-dioxane concentration in the RW-3S sample was two orders of magnitude lower than the other samples, with no compounds detected above the Groundwater Cleanup Standards. The concentrations of 1,1-dichloroethene and 1,4-dioxane in the RW-1S and RW-2S samples exhibit a significant decrease compared to the recovery well samples collected prior to and a short time (approximately one month) after the start of continuous pumping in late March 2017. Conversely, the concentrations of 1,1,1-TCA in the discharge from well RW-2S have shown a noticeable increase since the initiation of remedial pumping.

— In the deep recovery well samples, 1,1-DCE and 1,4-dioxane were detected at concentrations above the Groundwater Cleanup Standards (Figure 4; Table 2). The sample results indicate higher VOC levels in the discharge from well RW-2D in the southeastern portion of the Site compared to RW-1D, although concentrations in RW-1D samples have increased following the start of groundwater pumping. VOC and 1,4-dioxane concentrations in the August 2017 sample from RW-2D are similar to previously collected samples from this well (Figure 4).

2.0 PLANNED ONSITE ACTIVITIES FOR NEXT REPORTING PERIOD (OCTOBER 2017 – DECEMBER 2017)

— Continue with the operation and maintenance activities for the hydraulic containment system.

— Conduct the necessary effluent monitoring and reporting activities for the system discharge pursuant to the Permit and revised Biomonitoring Study Plan.

— Perform water level measurements, as necessary, and evaluate the data to assess the aquifer response to remedial pumping and capture of the VOC plumes in the unconfined and confined portions of the aquifer system.

— Conduct semi-annual sampling of the monitoring wells and recovery well discharge in mid-November 2017 pursuant to the Groundwater Monitoring Plan.

3.0 KEY PERSONNEL/FACILITY CHANGES

There were no changes to key project personnel during the reporting period.

FIGURES

STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03

MW-43

MW-39

MW-38R
105.24

MW-42
105.95

MW-18

MW-5R
106.6

MW-44

MW-09
114.01

MW-45
113.52

MW-20

MW-04
113.74

MW-16

MW-01
114.31

RW-1S

RW-2S

RW-3S

RW-1D

RW-2D

106 107 108 109 110 111 112 113 114

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL
- DEEP EXTRACTION WELL
- 113.74 GROUNDWATER SURFACE ELEVATION (FEET MSL)
- GROUNDWATER SURFACE CONTOUR (DASHED WHERE INFERRED)

0 140 280
SCALE IN FEET

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Approved: REJ 10/11/2017
DWG Name: 314V0390-066

FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND
PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 1

WATER TABLE CONTOUR MAP
AUGUST 31, 2017

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

STONY RUN

POND

WILLIAMS SCOTSMAN, INC.

NORTH WAREHOUSE

SOUTH WAREHOUSE

MW-03
106.01

MW-43
101.07

MW-39
100.09

MW-38R

RW-1S
101.41

MW-42

MW-18
100.47

RW-2S
91.40

MW-5R

RW-3S
99.20

MW-44
109.92

MW-09

MW-16
112.10

MW-04

MW-20
113.01

RW-1D

RW-2D

MW-01

106
104
108
110
112
94
96
98
100
102

POND

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL
- DEEP EXTRACTION WELL
- 101.07 PIEZOMETRIC SURFACE ELEVATION (FEET MSL)
- PIEZOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)

0 140 280
SCALE IN FEET

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FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND
PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 2

PIEZOMETRIC SURFACE CONTOUR MAP
FOR LOWER PORTION OF SHALLOW ZONE
AUGUST 31, 2017

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500

STONY RUN

MW-27D
86.09

MW-23D
85.30

POND

WILLIAMS
SCOTSMAN, INC.

NORTH WAREHOUSE

RW-1S

MW-16D
83.0

RW-2S

MW-40D
83.10

RW-3S

SOUTH WAREHOUSE

MW-22D
82.14

MW-41D

MW-01D

MW-21D
75.96

RW-1D

RW-2D
72.70

MW-24D
73.28

POND

86
85
84
83
82
81
80
79
78
77
76
75
74
73

N

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- DEEP MONITORING WELL
- SHALLOW EXTRACTION WELL
- DEEP EXTRACTION WELL
- 85.30 POTENTIOMETRIC SURFACE ELEVATION (FEET MSL)
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)

0 140 280
SCALE IN FEET

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NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A PROFESSIONAL. DO NOT ALTER THIS DOCUMENT IN ANY WAY WITHOUT THE WRITTEN CONSENT OF WSP USA INC.

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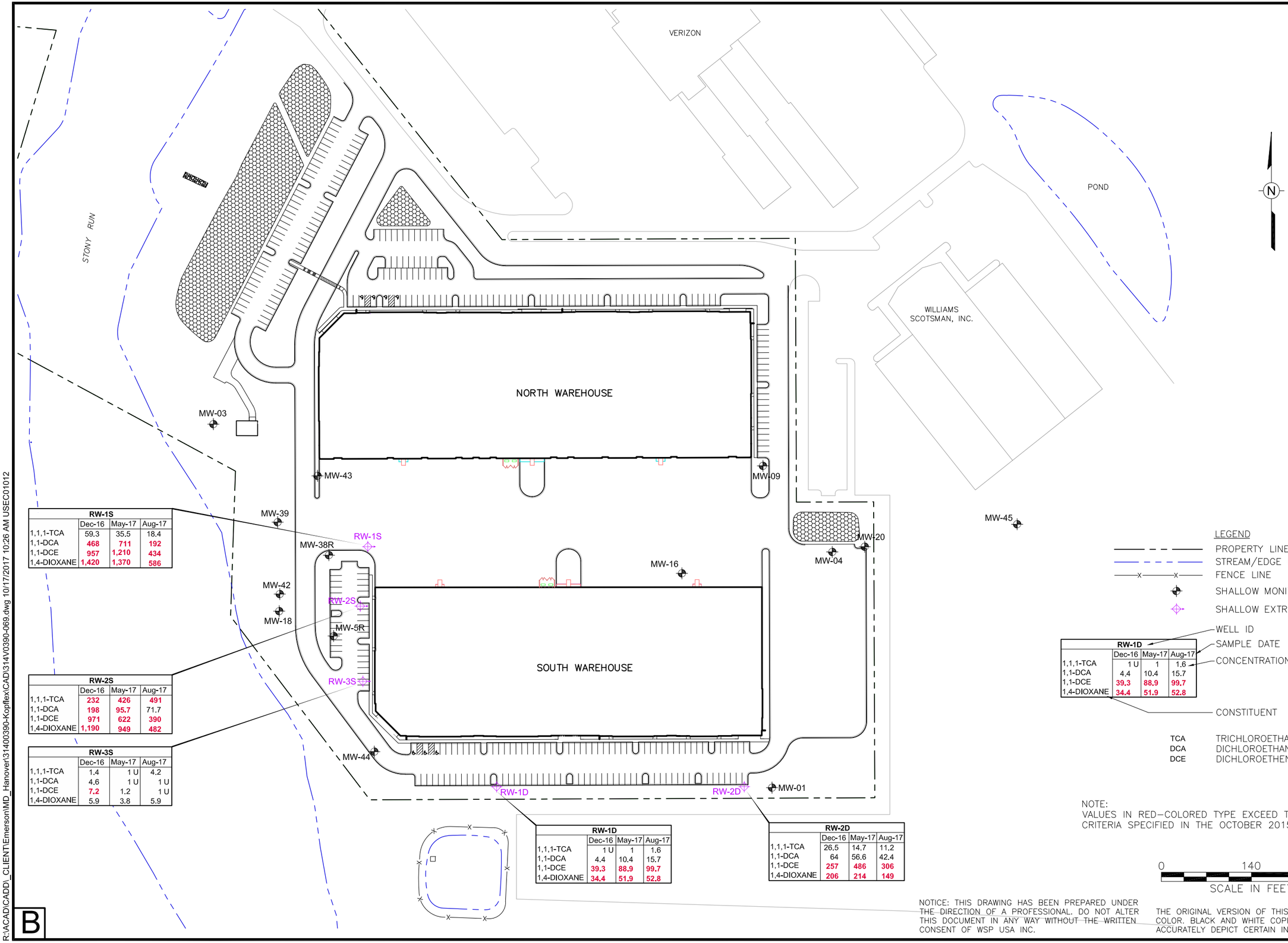
FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND

PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 3

POTENTIOMETRIC SURFACE CONTOUR MAP
FOR CONFINED ZONE OF LOWER
PATAPSCO AQUIFER – AUGUST 31, 2017

WSP USA Inc.
13530 DULLES TECHNOLOGY DR
SUITE 300
HERNDON, VA 20171
TEL: +1 703.709.6500



RW-1S	Dec-16	May-17	Aug-17
1,1,1-TCA	59.3	35.5	18.4
1,1-DCA	468	711	192
1,1-DCE	957	1,210	434
1,4-DIOXANE	1,420	1,370	586

RW-2S	Dec-16	May-17	Aug-17
1,1,1-TCA	232	426	491
1,1-DCA	198	95.7	71.7
1,1-DCE	971	622	390
1,4-DIOXANE	1,190	949	482

RW-3S	Dec-16	May-17	Aug-17
1,1,1-TCA	1.4	1 U	4.2
1,1-DCA	4.6	1 U	1 U
1,1-DCE	7.2	1.2	1 U
1,4-DIOXANE	5.9	3.8	5.9

RW-1D	Dec-16	May-17	Aug-17
1,1,1-TCA	1 U	1	1.6
1,1-DCA	4.4	10.4	15.7
1,1-DCE	39.3	88.9	99.7
1,4-DIOXANE	34.4	51.9	52.8

RW-2D	Dec-16	May-17	Aug-17
1,1,1-TCA	26.5	14.7	11.2
1,1-DCA	64	56.6	42.4
1,1-DCE	257	486	306
1,4-DIOXANE	206	214	149

LEGEND

- PROPERTY LINE
- STREAM/EDGE OF WATER
- FENCE LINE
- SHALLOW MONITORING WELL
- SHALLOW EXTRACTION WELL

RW-1D	Dec-16	May-17	Aug-17
1,1,1-TCA	1 U	1	1.6
1,1-DCA	4.4	10.4	15.7
1,1-DCE	39.3	88.9	99.7
1,4-DIOXANE	34.4	51.9	52.8

WELL ID
SAMPLE DATE
CONCENTRATION (ug/l)
CONSTITUENT

TCA TRICHLOROETHANE
DCA DICHLOROETHANE
DCE DICHLOROETHENE

NOTE:
VALUES IN RED-COLORED TYPE EXCEED THE CLEANUP CRITERIA SPECIFIED IN THE OCTOBER 2015 RAP.

0 140 280
SCALE IN FEET

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DWG Name: 314V0390-069

FORMER KOP-FLEX FACILITY SITE
HANOVER, MARYLAND
PREPARED FOR
EMERSUB 16 LLC
ST. LOUIS, MISSOURI

FIGURE 4

VOC CONCENTRATIONS IN BASELINE (DEC. 2016) AND REMEDIAL PUMPING DISCHARGE SAMPLES FROM RECOVERY WELLS

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TABLES

Table 1

Historical Water Level Measurements in Monitoring Wells
and Recovery Well Piezometers
Former Kop-Flex Facility Site
Hanover, Maryland
(December 2016 through August 2017) (a)

Well ID	Zone	TOC elevation	12/7/2016		3/21/2017		4/7/2017		4/10/2017		4/13/2017		4/17/2017		5/1/2017		5/8/2017		8/31/2017	
			Depth to Water	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*	*Depth to Water*	*Groundwater Elevation*
MW-01	Shallow	129.8	NM	-	16.16	113.64	15.93	113.87	15.95	113.85	15.94	113.86	15.90	113.90	15.92	113.88	15.81	113.99	15.49	114.31
MW-03	Shallow	113.6	6.78	106.82	6.79	106.81	6.41	107.19	6.76	106.84	6.91	106.69	6.90	106.70	6.96	106.64	6.87	106.73	7.59	106.01
MW-04	Shallow	124.4	12.28	112.12	11.17	113.23	11.05	113.35	11.09	113.31	11.06	113.34	11.13	113.27	10.95	113.45	10.91	113.49	10.66	113.74
MW-5R	Shallow	123.5	15.87	107.63	15.98	107.52	16.15	107.35	16.38	107.12	16.45	107.05	16.47	107.03	16.60	106.90	16.60	106.90	16.90	106.60
MW-09	Shallow	125.1	10.84	114.26	11.51	113.59	11.41	113.69	11.41	113.69	11.51	113.59	11.48	113.62	11.41	113.69	11.34	113.76	11.09	114.01
MW-16	Shallow	124.0	10.92	113.08	11.66	112.34	11.74	112.26	11.81	112.19	11.82	112.18	12.08	111.92	11.99	112.01	11.81	112.19	11.90	112.10
MW-18	Shallow	125.1	20.77	104.33	22.85	102.25	22.85	102.25	23.11	101.99	23.18	101.92	23.19	101.91	23.30	101.80	23.28	101.82	24.63	100.47
MW-20	Shallow	125.4	NM	-	12.5	112.90	12.33	113.07	12.31	113.09	12.3	113.10	13.38	112.02	13.01	112.39	12.24	113.16	12.39	113.01
MW-38R	Shallow	125.4	15.58	109.82	19.64	105.76	19.6	105.80	20.81	104.59	19.81	105.59	19.84	105.56	19.94	105.46	19.96	105.44	20.16	105.24
MW-39	Shallow	124.6	NM	-	22.64	101.96	22.55	102.05	21.86	102.74	23	101.60	23.01	101.59	23.05	101.55	23.00	101.60	24.51	100.09
MW-42	Shallow	125.9	16.18	109.72	19.28	106.62	19.33	106.57	19.52	106.38	19.49	106.41	19.55	106.35	19.68	106.22	19.67	106.23	19.95	105.95
MW-43	Shallow	122.8	19.25	103.55	20.68	102.12	20.31	102.49	20.61	102.19	21.81	100.99	20.92	101.88	21.11	101.69	20.90	101.90	21.73	101.07
MW-44	Shallow	127.1	14.93	112.17	17.7	109.40	17.08	110.02	17.18	109.92	17.35	109.75	17.23	109.87	17.31	109.79	17.27	109.83	17.18	109.92
MW-45	Shallow	126.7	NA	-	14.1	112.62	13.85	112.87	13.85	112.87	13.85	112.87	13.75	112.97	13.67	113.05	13.60	113.12	13.20	113.52
RW-1S	Shallow	122.9	12.96	109.94	12.96	109.94	20.36	102.54	20.6	102.30	20.56	102.34	20.60	102.30	20.80	102.10	20.79	102.11	21.49	101.41
RW-2S	Shallow	123.5	14.12	109.38	28.55	94.95	28.88	94.62	29.81	93.69	29	94.50	29.14	94.36	29.61	93.89	29.74	93.76	32.10	91.40
RW-3S	Shallow	125.4	14.29	111.11	20.34	105.06	23.49	101.91	23.59	101.81	23.69	101.71	23.73	101.67	24.32	101.08	24.46	100.94	26.20	99.20
MW-1D	Deep	129.4	42.81	86.59	56.15	73.25	56.06	73.34	56.22	73.18	56.44	72.96	56.37	73.03	56.40	73.00	56.29	73.11	56.70	72.70
MW-16D	Deep	124.1	34.91	89.19	37.55	86.55	37.6	86.50	38.02	86.08	38.1	86.00	37.94	86.16	37.98	86.12	38.08	86.02	41.1	83.00
MW-21D	Deep	126.3	37.8	88.50	47.12	79.18	47.26	79.04	47.57	78.73	47.61	78.69	47.58	78.72	47.54	78.76	47.61	78.69	56.7	69.60
MW-22D	Deep	128.9	40.78	88.07	43.28	85.57	43.3	85.55	43.59	85.26	43.76	85.09	43.73	85.12	43.82	85.03	43.81	85.04	46.71	82.14
MW-23D	Deep	125.2	35.14	90.06	36.33	88.87	36.29	88.91	36.72	88.48	36.81	88.39	36.61	88.59	36.71	88.49	36.77	88.43	39.9	85.30
MW-24D	Deep	129.1	46.3	82.80	47.44	81.66	47.71	81.39	48	81.10	48.16	80.94	48.29	80.81	48.35	80.75	48.37	80.73	55.82	73.28
MW-27D	Deep	117.2	29.66	87.54	27.73	89.47	27.68	89.52	28.18	89.02	28.3	88.90	28.03	89.17	28.21	88.99	28.21	88.99	31.11	86.09
MW-40D	Deep	124.1	35.14	88.96	37.19	86.91	37.51	86.59	37.98	86.12	37.98	86.12	37.85	86.25	38.01	86.09	38.04	86.06	41.00	83.10
MW-41D	Deep	127.1	41.98	85.12	44.00	83.10	44.06	83.04	44.48	82.62	44.56	82.54	44.43	82.67	44.61	82.49	44.62	82.48	49.18	77.92
RW-1D	Deep	126.9	38.53	88.37	58.69	68.21	59.02	67.88	59.06	67.84	59.02	67.88	59.26	67.64	58.88	68.02	58.99	67.91	60.23	66.67
RW-2D	Deep	127.4	42.31	85.09	68.82	58.58	68.51	58.89	68.39	59.01	68.78	58.62	68.63	58.77	68.70	58.70	68.44	58.96	70.11	57.29

a/ Vertical datum is NAVD-88
NM = not measured
TOC = top of casing
NA = not available because the well had not been installed
Light gray shading denotes wells screened in the shallow (unconfined) zone; blue shading denotes wells screened in the deep (confined) zone.
Continuous pumping of the groundwater recovery well system started on March 29, 2017

Table 2

August 2017 Recovery Well Discharge Sample Results
Former Kop-Flex Facility Site
Hanover, Maryland (a)

		Shallow Wells			Deep Wells	
Well ID:		**RW-1S**	**RW-2S**	**RW-3S**	**RW-1D**	**RW-2D**
Parameters	**Groundwater Cleanup Standards (µg/L) (b)**					
VOCs						
Chloroethane	3.6	**19.8**	4.0 U	1.0 U	1.0 U	2.0 U
1,1-Dichloroethane	90	**192**	71.7	1.1	15.7	42.4
1,2-Dichloroethane	5	4.0 U	4.0 U	1.0 U	1.0 U	2.7
1,1-Dichloroethene	7	**434**	**390**	1.7	**99.7**	**306**
1,4-Dioxane	6.7 (c)	**586**	**482**	5.9	**52.8**	**149**
1,1,1-Trichloroethane	200	18.4	**491**	4.2	1.6	11.2
Total VOCs Detected	---	1,250	1,435	12.9	170	511

a/ U = not detected above the method detection limit
Bolded values indicate an exceedence of the Groundwater Quality Standards
All sample concentrations in micrograms per liter (µg/l)
b/ Source: http://www.mde.maryland.gov/assets/document/Final%20Update%20No%202.1%20dated%205-20-08(1).pdf
c/ Value represents the MDE risk-based action level

ENCLOSURE A – THIRD QUARTER 2017 OPERATION AND MAINTENANCE REPORT

Third Quarter 2017 Operation and Maintenance Report
Groundwater Extraction and Treatment System
Former Kop-Flex Facility Site
Hanover, Maryland

Introduction

WSP USA Inc. has prepared this Quarterly Operation and Maintenance (O&M) Report for the groundwater extraction and treatment system (System) at the Former Kop-Flex Facility Site (Site) located in Hanover, Maryland. The System start-up was initiated on March 10, 2017, with continuous operation beginning on March 29, 2017. This O&M Report was prepared in accordance with the requirement specified in Chapter 14 of the October 2015 Response Action Plan (RAP), and covers the period of July 1, 2017, through September 30, 2017.

Groundwater is extracted from a network of three shallow extraction wells (RW-1S through RW-3S), screened within the Surficial aquifer, and two deep extraction wells (RW-1D and RW-2D), screened in the confined portion of the Lower Patapsco aquifer. The extracted groundwater is routed to the treatment system building. Treatment equipment is comprised of an equalization tank to regulate flow, a metering pump for the addition of an iron sequestering agent, bag filters for suspended solids removal, synthetic resin (AMBERSORB™ 560) for the removal of VOCs and 1,4-dioxane, a metering pump for the addition of caustic soda for pH buffering, and two in-line aerators to increase dissolved oxygen levels in the water.

The synthetic resin is regenerated onsite using steam process equipment, including a boiler, super-heater, and re-heater, to remove the adsorbed organic constituents. The two synthetic resin vessels (T-1100 and T-1200) are arranged in a lead-lag configuration until the lead vessel reaches its adsorption capacity for organic constituents, which is based on the volume of processed water. At that time, the lag vessel is switched into the lead position, and the contaminant-loaded vessel is taken out of operation. The loaded vessel undergoes steam regeneration to remove the absorbed organic constituents from the resin. The steam (or gas) containing the desorbed organic constituents is discharged to the atmosphere through the re-heater. Once the regeneration process is completed, the vessel is returned to operation as the lag vessel, and the cycle is repeated.

System Operation and Maintenance

During the third quarter of 2017, WSP subcontracted the O&M of the System to a local contractor, S&S Technologies, Inc. of Elkton, Maryland. Subcontractor oversight was provided by WSP engineer Maria Kaplan, working under the direction of Steve Kretschman, P.E. Routine O&M activities performed during the reporting period included the following:

- regeneration of the resin (as discussed below),
- replacement of bag filters,
- replenishment of caustic and iron sequestrant treatment chemicals, and
- recalibration and cleaning the inline pH probe.

Spent bag filters are managed as non-hazardous waste.

The system operated continuously with 99% uptime during the reporting period. The system was shut down on July 4th, 2017 due to a delay in the scheduled regeneration cycle caused by the holiday. The total monthly volumes discharged since start up in March, 2017 are shown in the table below.

Month	Total Discharged Volume (gal)
March 2017	809,756
April 2017	3,084,170
May 2017	3,287,318
June 2017	3,039,318
July 2017	2,711,979
August 2017	2,801,937
September 2017	2,737,836

A total of approximately 8.2 million gallons of extracted groundwater was treated by the System in the third quarter of 2017. Since start-up, the System has treated approximately 18.4 million gallons of water. The combined flows throughout the reporting period from the shallow recovery wells screened in the Surficial aquifer and deep recovery wells screened in the confined Lower Patapsco Aquifer are provided below.

Extraction Zone	Minimum Flow Rate (gpm)	Maximum Flow Rate (gpm)	Average Flow Rate (gpm)
Surficial (unconfined) Aquifer	10.10	10.50	10.37
Confined Lower Patapsco Aquifer	54.34	57.55	55.20

Resin Vessel Regeneration

The synthetic resin in the lead vessel must be regenerated after treating approximately 400,000 gallons of contaminated groundwater. The regeneration schedule requires that flow volumes be monitored throughout the week and adjustments made in the regeneration timing to account for holidays. Given the total extraction rate from the recovery well network, each resin vessel was regenerated once per week during the reporting period. A summary of the regeneration schedule for third quarter 2017 is provided below.

- Vessel T-1100 processed approximately 371,000 gallons of water, or approximately four days of flow, as the lead vessel before regeneration
- Vessel T-1200 processed approximately 280,000 gallons of water, or approximately 3 days of flow, as the lead vessel before regeneration

Treatment System Performance Monitoring

Performance of the System treatment equipment was monitored by collecting and analyzing influent and effluent water samples from in-line sample ports located at the treatment building. Effluent samples were also collected to fulfill the monitoring requirements specified in the state discharge and National Pollutant Discharge Elimination System (NPDES) permit. The treatment system samples were collected monthly throughout the reporting period. The water samples were analyzed for VOCs using USEPA SW-846 Test Method 8260B and 1,4-dioxane using modified USEPA SW-846 Test Method 8260B with selective ion monitoring.

The historical analytical results for the treatment system influent and effluent samples are summarized in Tables A-1 and A-2, respectively. (Certified laboratory analytical reports for the July 2017 through September 2017 samples are included in Attachment 1.) Influent VOC and 1,4-dioxane results were compared to the

cleanup criteria, identified as the groundwater cleanup levels for Type I/II aquifers specified in Table 1 of the MDE Cleanup Standards and stated in the October 2015 Response Action Plan. Based on the analytical results, 1,1-DCE and 1,4-dioxane were the only constituents detected above their respective cleanup criteria in the influent samples collected during the reporting period. For samples collected during the third quarter, the total chlorinated VOC concentrations, excluding 1,4-dioxane, ranged from 320.1 µg/l (September 2017) to 358.9 µg/l (July 2017). The 1,4-dioxane concentrations in the influent for the third quarter 2017 ranged from 160 µg/l (September 2017) to 170 µg/l (July 2017 and August 2017). The chlorinated VOC and 1,4-dioxane concentrations are below anticipated concentrations used for the design of the treatment system. Figure A-1 plots the concentration of VOCs and 1,4-dioxane in the treatment system influent from start-up (March 2017) through September 2017.

Other chlorinated VOCs detected in the treatment system influent include trichloroethene, 1,1-dichloroethane (DCA), 1,1,1-trichloroethane (TCA), cis-1,2-DCE, 1,2-DCA and chloroethane. All of these compounds, except for 1,1,1-TCA and 1,1-DCA, were present at very low concentrations (<3 µg/l) in the influent samples from July 2017 through September 2017.

No VOCs were detected at concentrations above the method reporting limits in the effluent water samples. Concentrations of 1,4-dioxane in the effluent water samples ranged from non-detect in the July 2017 and August 2017 samples to 1.2 µg/l in the September 2017 sample. The 1,4-dioxane detection in September was below the site-specific clean-up criterion of 15 µg/l. The removal efficiencies for both chlorinated VOCs and 1,4-dioxane were 100% during the reporting period.

During the third quarter 2017 period, the System removed an estimated 22.9 pounds of the primary chlorinated VOCs and 11.5 pounds of 1,4-dioxane. A breakdown of the mass removal for the primary chlorinated VOCs is provided below.

- 1,1,1-TCA 2.8 pounds
- 1,1-DCA 3.4 pounds
- 1,1-DCE 16.7 pounds

From March 2017 through September 2017, the System removed approximately 65.9 pounds of chlorinated VOCs and 32.7 pounds of 1,4-dioxane (Figure A-2).

The monthly sampling results for the treatment system effluent indicates the current regeneration frequency for the resin vessels is sufficient to ensure compliance with discharge limits specified in the NPDES permit and other applicable treatment criteria. NPDES discharge monitoring reports (DMRs) are submitted to MDE monthly through the electronic data reporting system. As indicated in the July 2017 through September 2017 DMRs, the analytical results for the monitoring parameters demonstrate compliance with the permit limitations.

Anticipated Activities for Fourth Quarter 2017

Routine monthly and quarterly O&M activities will be conducted during the next reporting period (October 2017 through December 2017). Given the detection of 1,4-dioxane in the September 2017 System effluent sample, a reset of the resin regeneration cycle will be conducted in October 2017 so the T-1200 vessel will be the lead vessel for four days followed by the T-1100 vessel as lead for 3 days. It is anticipated that regeneration resets will need to be conducted semi-annually for the resin vessels.

TABLES

Table A-1

Treatment System Influent Sample Data
Former Kop-Flex Facility Site
Hanover, MD

Analyte Name	Cas#	Groundwater Cleanup Standards (µg/L) (c)	Influent VSP-1 3/13/2017	Influent VSP-1 3/15/2017	Influent VSP-1 3/20/2017	Influent VSP-1 3/23/2017	Influent VSP-1 3/29/2017	Influent VSP-1 4/3/2017	Influent VSP-1 4/12/2017	Influent VSP-1 4/19/2017	Influent VSP-1 5/8/2017	Influent VSP-1 6/21/2017	Influent VSP-1 7/10/2017	Influent VSP-1 8/3/2017	Influent VSP-1 9/11/2017
Volatile Organic Compounds (US EPA Method 8260)															
1,1,1-Trichloroethane	71-55-6	200	55	150	92	81	82	62	55	49	41	39	44	41	35
1,1-Dichloroethane	75-34-3	90	**180**	**200**	**110**	**140**	**150**	**140**	**140**	**120**	86	59	57	49	40
1,1-Dichloroethene	75-35-4	7	**260**	**360**	**260**	**360**	**360**	**390**	**380**	**410**	**360**	**310**	**250**	**230**	**240**
1,2-Dichloroethane	107-06-2	5	2	2	3	3	4	4	4	3	3	2.1	2.1	2	1.7
Chloroethane	75-00-3	36	3	3	2	2	2	3	3	3	3	2.7	2.3	1.8	1.7
cis-1,2-Dichloroethene	156-59-2	70	2	2	1	2	2	3	3	2	2	1.4	1.3	1.3	1 U
Tetrachloroethene	127-18-4	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	79-01-6	5	2	3	2	3	3	3	3	3	3	2.2	2.2	2	1.7
Vinyl Chloride	75-01-4	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL VOCs:		-	538.7	722.6	470.2	591.1	603.6	603.8	586.5	589.6	496.8	416.4	358.9	327.1	320.1
Volatile Organic Compounds (US EPA Method 8260 - SIM)															
1,4-Dioxane	71-55-6	15	**250**	**440**	**360**	**330**	**340**	**330**	**290**	**270**	**220**	**190**	**170**	**170**	**160**

a/ µg/L = micrograms per liter; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds;
Results shown in highlight and **bold** exceed the comparison standard. All results given in µg/L
b/ Maryland Generic Numeric Cleanup Standards for Groundwater, Type I and II Aquifers, from the State of Maryland Interim Final Guidance (December 2000).
Accessed June 1, 2017: http://msa.maryland.gov/megafile/msa/speccol/sc5300/sc5339/000113/000000/000223/unrestricted/20040349e.pdf
c/ Numeric cleanup standards from Section 6 of WSP's October 2, 2015, Response Action Plan, Revision 2.

Table A-2

Treatment System Effluent Sample Data
Former Kop-Flex Facility Site
Hanover, MD

Analyte Name	Cas#	Effluent VSP-4 03/13/2017 (a)	Effluent VSP-4 03/14/2017	Effluent VSP-4 03/14/2017	Effluent VSP-4 3/20/2017 (a)	Effluent VSP-4 3/23/2017	Effluent VSP-4 4/3/2017 (a)	Effluent VSP-4 4/12/2017	Effluent VSP-4 4/19/2017	Effluent VSP-4 5/8/2017	Effluent VSP-4 6/21/2017 (a)	Effluent VSP-4 7/10/2017 (a)	Effluent VSP-4 8/3/2017 (a)	Effluent VSP-4 9/11/2017 (a)
Volatile Organic Compounds (US EPA Method 8260)														
1,1,1-Trichloroethane	71-55-6	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethane	75-34-3	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,1-Dichloroethene	75-35-4	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dichloroethane	107-06-2	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroethane	75-00-3	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	156-59-2	NA	1.0 U	1.0 U	NA	1.0 U	NA	1.0 U	1.0 U	1.0 U	NA	NA	NA	NA
Tetrachloroethene	127-18-4	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Trichloroethene	79-01-6	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Vinyl Chloride	75-01-4	NA	1.0 U	1.0 U	5.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	5.0 U	5.0 U	5.0 U	5.0 U
	TOTAL VOCs:	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compounds (US EPA Method 8260 - SIM)														
1,4-Dioxane	71-55-6	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	1.0 U	1.2

a/ VOCs were analyzed by Method 624 to fulfill the NPDES permit requirement.

b/ All results given in micrograms/liter

c/ NA = not available, U = concentrations not detected above the method detection limit, ND = non-detect; EPA = Environmental Protection Agency; SIM = selected ion method; VOCs= volatile organic compounds

FIGURES

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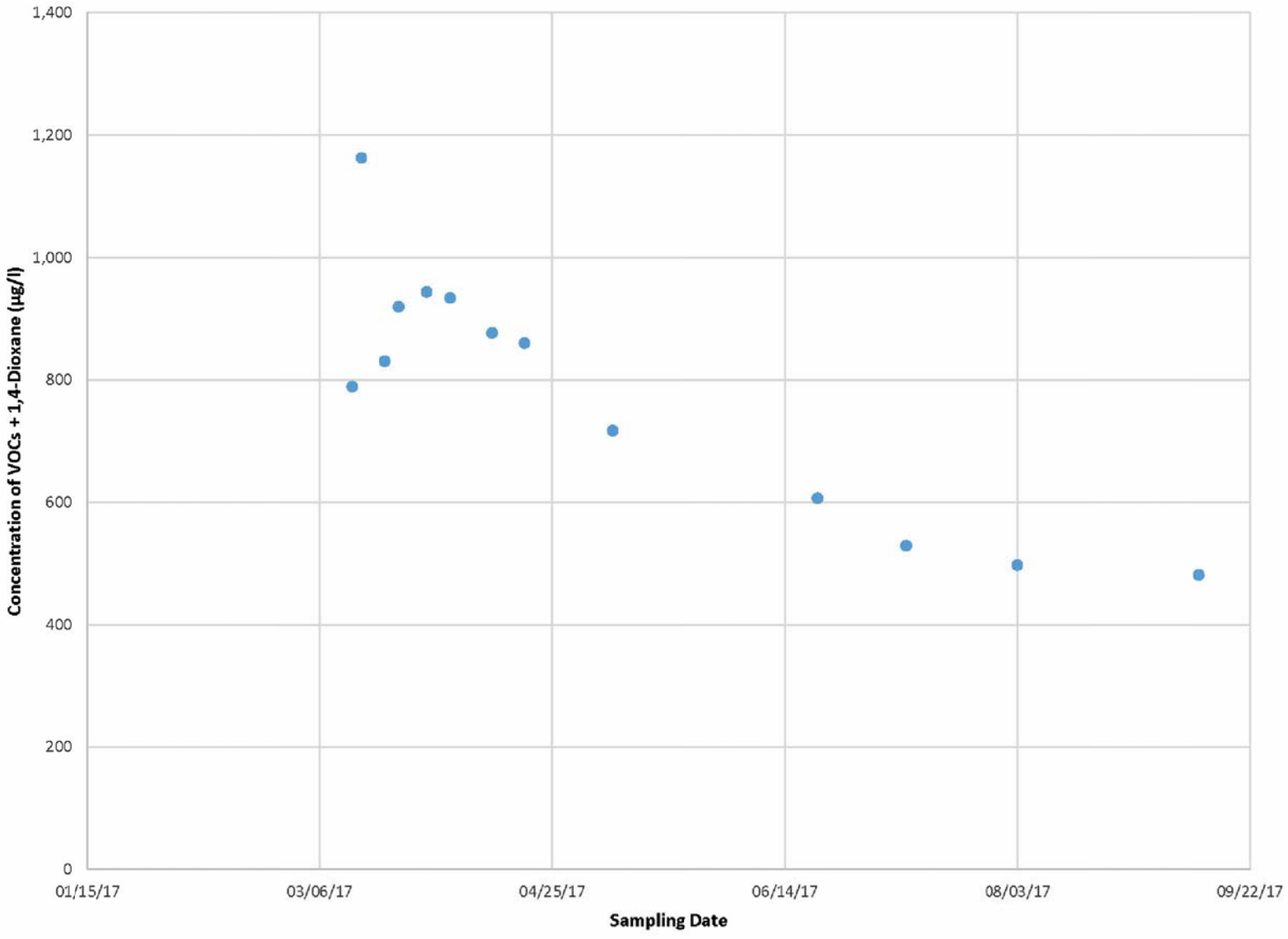

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Figure A–1

CONCENTRATION OF VOCs AND 1,4–DIOXANE IN TREATMENT SYSTEM INFLUENT (MARCH 2017 THROUGH SEPTEMBER 2017)

FORMER KOP–FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Drawn By: EGC
Checked: MJK 10/26/2017
Approved: RKJ
DWG Name: 314V0390–072

R:\ACAD\CADD_CLIENT\Emerson\MD_Hanover\31400390-Kopflex\CAD\314V0390-072.dwg 10/26/2017 8:48 AM USEC01012

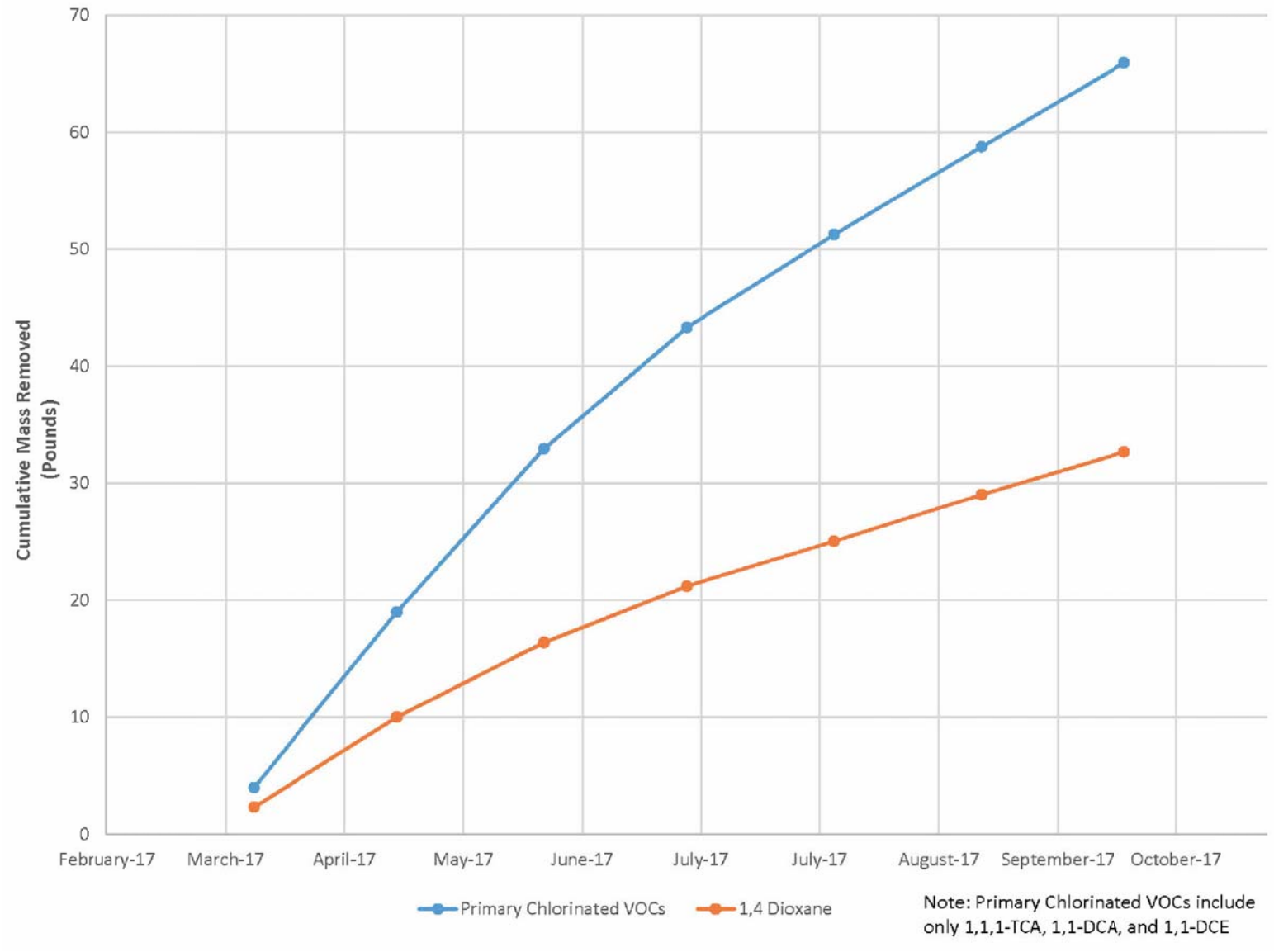

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Figure A–2

CUMULATIVE MASS REMOVAL
FOR THE PRIMARY CHLORINATED
VOCs AND 1,4–DIOXANE

FORMER KOP–FLEX FACILITY
HANOVER, MARYLAND

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

Drawn By: EGC
Checked: MJK 10/26/2017
Approved: RKJ
DWG Name: 314V0390–072

ATTACHMENT 1 – LABORATORY ANALYTICAL REPORTS FOR TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLES (JULY 2017 – SEPTEMBER 2017)

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17071007

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

July 18, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

July 18, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17071007**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-09

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17071007**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on August 14, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17071007

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/10/2017 at 12:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17071007-001	Effluent VSP - 4	WASTE WATER	07/10/17 11:08

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071007

WSP USA - Herndon, Herndon, VA

July 18, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP - 4 **Date/Time Sampled: 07/10/2017 11:08** **PSS Sample ID: 17071007-001**
Matrix: WASTE WATER **Date/Time Received: 07/10/2017 12:45**

Dissolved Metals — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**2.3**	ug/L	1.0		1	07/13/17	07/14/17 00:20	1051
Lead	ND	ug/L	1.0		1	07/13/17	07/14/17 00:20	1051
Nickel	**9.3**	ug/L	1.0		1	07/13/17	07/14/17 00:20	1051
Zinc	ND	ug/L	20		1	07/13/17	07/14/17 00:20	1051

Total Metals + Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.6**	ug/L	1.0		1	07/11/17	07/11/17 18:01	1051
Lead	ND	ug/L	1.0		1	07/11/17	07/11/17 18:01	1051
Nickel	**9.7**	ug/L	1.0		1	07/11/17	07/11/17 18:01	1051
Zinc	**23.7**	ug/L	20.0		1	07/11/17	07/11/17 18:01	1051
Hardness (Ca & Mg)	**14**	mg/L	0.66		1	07/11/17	07/11/17 18:01	1051

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071007

WSP USA - Herndon, Herndon, VA

July 18, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP - 4 **Date/Time Sampled: 07/10/2017 11:08** **PSS Sample ID: 17071007-001**
Matrix: WASTE WATER **Date/Time Received: 07/10/2017 12:45**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=2

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Chloromethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Vinyl Chloride	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Bromomethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Chloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Methylene Chloride	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Chloroform	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Benzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Trichloroethene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Bromodichloromethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Toluene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Tetrachloroethylene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Dibromochloromethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Chlorobenzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Ethylbenzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
Bromoform	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011

OFFICES:
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071007

WSP USA - Herndon, Herndon, VA

July 18, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP - 4 **Date/Time Sampled: 07/10/2017 11:08** **PSS Sample ID: 17071007-001**
Matrix: WASTE WATER **Date/Time Received: 07/10/2017 12:45**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=2

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	07/14/17	07/14/17 16:07	1011

Total Suspended Solids Analytical Method: SM 2540D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	2.0		1	07/10/17	07/10/17 15:31	1061

Biochemical Oxygen Demand Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	5.0		07/12/17	07/17/17 12:00	4005

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17071007
Project ID: 31400390-09

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Acrolein and acrylonitrile not required for EPA 624 samples.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

17071007: Analyses associated with analyst code 4005 were performed by Enviro-Chem Laboratories, Inc.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SM 5210B -2011

Analytical Data Package Information Summary

Work Order(s): 17071007
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop-Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	Effluent VSP - 4	Initial	17071007-001	1051	W	66903	144319	07/10/2017	07/11/2017 08:54	07/11/2017 18:01
	66903-1-BKS	BKS	66903-1-BKS	1051	W	66903	144319	--------	07/11/2017 08:54	07/11/2017 15:36
	66903-1-BLK	BLK	66903-1-BLK	1051	W	66903	144319	--------	07/11/2017 08:54	07/11/2017 15:02
	Covanta S	MS	17071001-008 S	1051	W	66903	144319	07/04/2017	07/11/2017 08:54	07/11/2017 15:50
	Covanta SD	MSD	17071001-008 SD	1051	W	66903	144319	07/04/2017	07/11/2017 08:54	07/11/2017 15:57
EPA 200.8	Effluent VSP - 4	Initial	17071007-001	1051	W	66963	144394	07/10/2017	07/13/2017 14:49	07/14/2017 00:20
	66963-1-BKS	BKS	66963-1-BKS	1051	W	66963	144394	--------	07/13/2017 14:49	07/14/2017 00:13
	66963-1-BLK	BLK	66963-1-BLK	1051	W	66963	144394	--------	07/13/2017 14:49	07/14/2017 01:53
	Effluent VSP - 4 S	MS	17071007-001 S	1051	W	66963	144394	07/10/2017	07/13/2017 14:49	07/14/2017 00:27
	Effluent VSP - 4 SD	MSD	17071007-001 SD	1051	W	66963	144394	07/10/2017	07/13/2017 14:49	07/14/2017 00:33
EPA 624	Effluent VSP - 4	Initial	17071007-001	1011	W	66985	144410	07/10/2017	07/14/2017 08:12	07/14/2017 16:07
	66985-1-BKS	BKS	66985-1-BKS	1011	W	66985	144410	--------	07/14/2017 08:12	07/14/2017 10:42
	66985-1-BLK	BLK	66985-1-BLK	1011	W	66985	144410	--------	07/14/2017 08:12	07/14/2017 11:21
	Greenbelt Day #1 - Grab S	MS	17071209-001 S	1011	W	66985	144410	07/12/2017	07/14/2017 08:12	07/14/2017 12:46
	Greenbelt Day #1 - Grab SD	MSD	17071209-001 SD	1011	W	66985	144410	07/12/2017	07/14/2017 08:12	07/14/2017 13:27
SM 2540D -2011	Effluent VSP - 4	Initial	17071007-001	1061	W	144257	144257	07/10/2017	07/10/2017 15:31	07/10/2017 15:31
	144257-1-BLK	BLK	144257-1-BLK	1061	W	144257	144257	--------	07/10/2017 15:31	07/10/2017 15:31
	001 D	MD	17070703-001 D	1061	W	144257	144257	07/06/2017	07/10/2017 15:31	07/10/2017 15:31
	Effluent VSP - 4 D	MD	17071007-001 D	1061	W	144257	144257	07/10/2017	07/10/2017 15:31	07/10/2017 15:31
SM 5210B -2011	Effluent VSP - 4	Initial	17071007-001	4005	W	144452	144452	07/10/2017	07/12/2017 00:00	07/17/2017 12:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071007

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 144410 Matrix: Waste Water Date Prep: 07/14/2017
PSS Sample ID: 17071007-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	104		87-114	%	07/14/17 16:07
4-Bromofluorobenzene	113		90-114	%	07/14/17 16:07
Toluene-D8	98		93-108	%	07/14/17 16:07

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071007

WSP USA - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 144257 Matrix: Water
MB Sample Id: 144257-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	07/10/17 15:31	

Analytical Method: SM 2540D -2011
Seq Number: 144257 Matrix: Waste Water
Parent Sample Id: 17071007-001 MD Sample Id: 17071007-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Suspended Solids	<1.923	<1.923	0	10	mg/L	07/10/17 15:31	U

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 144319 Matrix: Water Date Prep: 07/11/17
MB Sample Id: 66903-1-BLK LCS Sample Id: 66903-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	387	97	85-115	ug/L	07/11/17 15:36	
Copper	<1.000	40.00	41.84	105	85-115	ug/L	07/11/17 15:36	
Lead	<1.000	40.00	37.19	93	85-115	ug/L	07/11/17 15:36	
Magnesium	<100	400	336.2	84	85-115	ug/L	07/11/17 15:36	L
Nickel	<1.000	40.00	39.81	100	85-115	ug/L	07/11/17 15:36	
Zinc	<20.00	200	214	107	85-115	ug/L	07/11/17 15:36	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 144394 Matrix: Water Date Prep: 07/13/17
MB Sample Id: 66963-1-BLK LCS Sample Id: 66963-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.38	96	85-115	ug/L	07/14/17 00:13	
Lead	<1.000	40.00	37.42	94	85-115	ug/L	07/14/17 00:13	
Nickel	<1.000	40.00	38.51	96	85-115	ug/L	07/14/17 00:13	
Zinc	<20.00	200	195.2	98	85-115	ug/L	07/14/17 00:13	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 144394 Matrix: Waste Water Date Prep: 07/13/17
Parent Sample Id: 17071007-001 MS Sample Id: 17071007-001 S MSD Sample Id: 17071007-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	2.330	40.00	40.11	94	40.16	95	70-130	0	25	ug/L	07/14/17 00:27	
Lead	<1.000	40.00	38.41	96	38.65	97	70-130	1	25	ug/L	07/14/17 00:27	
Nickel	9.310	40.00	46.65	93	46.52	93	70-130	0	25	ug/L	07/14/17 00:27	
Zinc	<20.00	200	203.4	102	204.9	102	70-130	1	25	ug/L	07/14/17 00:27	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071007

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 144410 Matrix: Water Date Prep: 07/14/17

MB Sample Id: 66985-1-BLK LCS Sample Id: 66985-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	62.72	105	51-139	ug/L	07/14/17 10:42	
Chloromethane	<5.000	60.00	52.30	87	56-144	ug/L	07/14/17 10:42	
Vinyl Chloride	<5.000	60.00	59.08	98	46-157	ug/L	07/14/17 10:42	
Bromomethane	<5.000	60.00	62.10	104	63-134	ug/L	07/14/17 10:42	
Chloroethane	<5.000	60.00	57.04	95	56-143	ug/L	07/14/17 10:42	
Trichlorofluoromethane	<5.000	60.00	70.16	117	56-138	ug/L	07/14/17 10:42	
1,1-Dichloroethene	<5.000	60.00	66.17	110	63-134	ug/L	07/14/17 10:42	
Methylene Chloride	<5.000	60.00	65.15	109	65-126	ug/L	07/14/17 10:42	
trans-1,2-dichloroethene	<5.000	60.00	67.69	113	67-129	ug/L	07/14/17 10:42	
1,1-Dichloroethane	<5.000	60.00	65.29	109	66-131	ug/L	07/14/17 10:42	
Chloroform	<5.000	60.00	65.25	109	69-130	ug/L	07/14/17 10:42	
1,1,1-Trichloroethane	<5.000	60.00	69.97	117	66-129	ug/L	07/14/17 10:42	
Carbon Tetrachloride	<5.000	60.00	69.56	116	70-133	ug/L	07/14/17 10:42	
Benzene	<5.000	60.00	66.61	111	69-127	ug/L	07/14/17 10:42	
1,2-Dichloroethane	<5.000	60.00	68.20	114	62-133	ug/L	07/14/17 10:42	
Trichloroethene	<5.000	60.00	67.30	112	71-127	ug/L	07/14/17 10:42	
1,2-Dichloropropane	<5.000	60.00	65.46	109	67-133	ug/L	07/14/17 10:42	
Bromodichloromethane	<5.000	60.00	67.84	113	63-132	ug/L	07/14/17 10:42	
2-Chloroethyl Vinyl Ether	<5.000	60.00	58.12	97	21-140	ug/L	07/14/17 10:42	
cis-1,3-Dichloropropene	<5.000	60.00	60.26	100	65-128	ug/L	07/14/17 10:42	
Toluene	<5.000	60.00	67.92	113	67-130	ug/L	07/14/17 10:42	
trans-1,3-dichloropropene	<5.000	60.00	61.07	102	63-127	ug/L	07/14/17 10:42	
1,1,2-Trichloroethane	<5.000	60.00	69.70	116	62-136	ug/L	07/14/17 10:42	
Tetrachloroethylene	<5.000	60.00	72.16	120	64-135	ug/L	07/14/17 10:42	
Dibromochloromethane	<5.000	60.00	66.95	112	65-126	ug/L	07/14/17 10:42	
Chlorobenzene	<5.000	60.00	66.50	111	70-127	ug/L	07/14/17 10:42	
Ethylbenzene	<5.000	60.00	65.03	108	71-131	ug/L	07/14/17 10:42	
Bromoform	<5.000	60.00	71.67	119	58-128	ug/L	07/14/17 10:42	
1,1,2,2-Tetrachloroethane	<5.000	60.00	62.62	104	63-134	ug/L	07/14/17 10:42	
1,3-Dichlorobenzene	<5.000	60.00	68.38	114	67-128	ug/L	07/14/17 10:42	
1,4-Dichlorobenzene	<5.000	60.00	67.07	112	67-127	ug/L	07/14/17 10:42	
1,2-Dichlorobenzene	<5.000	60.00	69.33	116	67-126	ug/L	07/14/17 10:42	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	108		107		87-114	%	07/14/17 10:42
4-Bromofluorobenzene	122	*	88	*	90-114	%	07/14/17 10:42
Toluene-D8	99		103		93-108	%	07/14/17 10:42

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC. @NPDES monthly

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA

PSS Work Order #: 17071007 PAGE 1 OF 1

*PROJECT MGR: Eric Johnson PHONE NO.: (703) 705-6500

EMAIL: eric.johnson@wsp.com FAX NO.: ( )

*PROJECT NAME: Kopflex PROJECT NO.: 31400390-09

SITE LOCATION: Hanover, MD P.O. NO.:

SAMPLER(S): Maria Kaplan DW CERT NO.:

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	BOD5	TSS	Total Dissolved Metals: Zn, Cu, Pb, Ni (HNO3)	Total Metals Zn, Cu, Pb, Ni (HNO3)	Hardness (CaCO3) (HNO3)	VOCs (624) (HCl)					REMARKS
1	Effluent USP-4	7/10/17	1108	WW	1	G	X										
1	Effluent USP-4	7/10/17	1108	WW	1	G		X									
1	Effluent USP-4	7/10/17	1108	WW	1	G			X								Lab to filter
1	Effluent USP-4	7/10/17	1108	WW	1	G				X	X						
1	Effluent USP-4	7/10/17	1108	WW	3	G						X					

(3) Preservatives Used / Analysis/Method Required

(5)

Relinquished By	Date	Time	Received By
Relinquished By: (1) [signature]	7/10/17	1245	Received By: [signature]
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4) *Requested TAT (One TAT per COC): [X] 5-Day [ ] 3-Day [ ] 2-Day [ ] Next Day [ ] Emergency [ ] Other

Data Deliverables Required: COA [ ] QC SUMM [ ] CLP LIKE [ ] OTHER ______

Special Instructions:

DW COMPLIANCE? YES [ ] EDD FORMAT TYPE ______

# of Coolers: 1 Temp Blank 14°C
Custody Seal: ABS
Ice Present: PRES Temp: 9°-14°C
Shipping Carrier: Client

STATE RESULTS REPORTED TO: MD [ ] DE [ ] PA [ ] VA [ ] WV [ ] OTHER ______

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17071007	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	07/10/2017 12:45:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	08/14/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	14
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 7

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	No
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		No
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Acrolein and acrylonitrile not required for EPA 624 samples.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Samples Inspected/Checklist Completed By: Barb Weber Date: 07/10/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 07/10/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17071008

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

Project ID : 31400390-09

July 17, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

July 17, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17071008**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-09

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17071008**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on August 14, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17071008

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/10/2017 at 12:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17071008-001	Influent VSP - 1	GROUND WATER	07/10/17 11:30
17071008-002	Effluent VSP -4	WASTE WATER	07/10/17 11:08
17071008-003	TB - 071017	WATER	07/10/17 12:45

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071008

WSP USA - Herndon, Herndon, VA

July 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Influent VSP - 1 **Date/Time Sampled: 07/10/2017 11:30** **PSS Sample ID: 17071008-001**
Matrix: GROUND WATER **Date/Time Received: 07/10/2017 12:45**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
Benzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Bromochloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Bromodichloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Bromoform	ND	ug/L	5.0		1	07/12/17	07/12/17 11:41	1011
Bromomethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
2-Butanone (MEK)	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
Carbon Disulfide	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Chlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Chloroethane	**2.3**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Chloroform	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Chloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Cyclohexane	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	07/12/17	07/12/17 11:41	1011
Dibromochloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,1-Dichloroethane	**57**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2-Dichloroethane	**2.1**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,1-Dichloroethene	**250**	ug/L	10		10	07/12/17	07/12/17 12:04	1011
cis-1,2-Dichloroethene	**1.3**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Ethylbenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071008

WSP USA - Herndon, Herndon, VA

July 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Influent VSP - 1 **Date/Time Sampled: 07/10/2017 11:30** **PSS Sample ID: 17071008-001**
Matrix: GROUND WATER **Date/Time Received: 07/10/2017 12:45**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	07/12/17	07/12/17 11:41	1011
Isopropylbenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Methyl Acetate	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
Methylcyclohexane	ND	ug/L	10		1	07/12/17	07/12/17 11:41	1011
Methylene Chloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	07/12/17	07/12/17 11:41	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Naphthalene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Styrene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Tetrachloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Toluene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,1,1-Trichloroethane	**44**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Trichloroethene	**2.2**	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	07/12/17	07/12/17 11:41	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
Vinyl Chloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011
m,p-Xylenes	ND	ug/L	2.0		1	07/12/17	07/12/17 11:41	1011
o-Xylene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:41	1011

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	**170**	ug/L	10		10	07/14/17	07/14/17 16:16	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071008

WSP USA - Herndon, Herndon, VA

July 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP -4 **Date/Time Sampled: 07/10/2017 11:08** **PSS Sample ID: 17071008-002**
Matrix: WASTE WATER **Date/Time Received: 07/10/2017 12:45**

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	ND	ug/L	1.0		1	07/14/17	07/14/17 15:53	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071008

WSP USA - Herndon, Herndon, VA

July 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: TB - 071017 **Date/Time Sampled: 07/10/2017 12:45** **PSS Sample ID: 17071008-003**
Matrix: WATER **Date/Time Received: 07/10/2017 12:45**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
Benzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Bromochloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Bromodichloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Bromoform	ND	ug/L	5.0		1	07/12/17	07/12/17 11:18	1011
Bromomethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
2-Butanone (MEK)	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
Carbon Disulfide	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Chlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Chloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Chloroform	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Chloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Cyclohexane	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	07/12/17	07/12/17 11:18	1011
Dibromochloromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Ethylbenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071008

WSP USA - Herndon, Herndon, VA

July 17, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: TB - 071017 **Date/Time Sampled: 07/10/2017 12:45** **PSS Sample ID: 17071008-003**
Matrix: WATER **Date/Time Received: 07/10/2017 12:45**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	07/12/17	07/12/17 11:18	1011
Isopropylbenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Methyl Acetate	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
Methylcyclohexane	ND	ug/L	10		1	07/12/17	07/12/17 11:18	1011
Methylene Chloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	07/12/17	07/12/17 11:18	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Naphthalene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Styrene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Tetrachloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Toluene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Trichloroethene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	07/12/17	07/12/17 11:18	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
Vinyl Chloride	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011
m,p-Xylenes	ND	ug/L	2.0		1	07/12/17	07/12/17 11:18	1011
o-Xylene	ND	ug/L	1.0		1	07/12/17	07/12/17 11:18	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17071008

Project ID: 31400390-09

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SW-846 8260 B-Modified: 1,4-Dioxane

Analytical Data Package Information Summary

Work Order(s): 17071008
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop-Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	Influent VSP - 1	Initial	17071008-001	1011	W	66946	144332	07/10/2017	07/12/2017 08:13	07/12/2017 11:41
	TB - 071017	Initial	17071008-003	1011	W	66946	144332	07/10/2017	07/12/2017 08:13	07/12/2017 11:18
	66946-1-BKS	BKS	66946-1-BKS	1011	W	66946	144332	--------	07/12/2017 08:13	07/12/2017 09:16
	66946-1-BLK	BLK	66946-1-BLK	1011	W	66946	144332	--------	07/12/2017 08:13	07/12/2017 10:10
	SYS EFF S	MS	17071012-001 S	1011	W	66946	144332	07/10/2017	07/12/2017 08:13	07/12/2017 12:25
	SYS EFF SD	MSD	17071012-001 SD	1011	W	66946	144332	07/10/2017	07/12/2017 08:13	07/12/2017 14:45
	Influent VSP - 1	Reanalysis	17071008-001	1011	W	66946	144332	07/10/2017	07/12/2017 08:13	07/12/2017 12:04
SW-846 8260 B-Modified	Effluent VSP -4	Initial	17071008-002	1011	W	66988	144415	07/10/2017	07/14/2017 08:39	07/14/2017 15:53
	66988-1-BKS	BKS	66988-1-BKS	1011	W	66988	144415	--------	07/14/2017 08:39	07/14/2017 14:05
	66988-1-BLK	BLK	66988-1-BLK	1011	W	66988	144415	--------	07/14/2017 08:39	07/14/2017 15:31
	66988-1-BSD	BSD	66988-1-BSD	1011	W	66988	144415	--------	07/14/2017 08:39	07/14/2017 14:27
	Influent VSP - 1	Reanalysis	17071008-001	1011	W	66988	144415	07/10/2017	07/14/2017 08:39	07/14/2017 16:16

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071008

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144332 Matrix: Ground Water Date Prep: 07/12/2017
PSS Sample ID: 17071008-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		86-111	%	07/12/17 11:41
Dibromofluoromethane	100		91-119	%	07/12/17 11:41
Toluene-D8	97		90-117	%	07/12/17 11:41

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 144415 Matrix: Ground Water Date Prep: 07/14/2017
PSS Sample ID: 17071008-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	07/14/17 16:37

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 144415 Matrix: Waste Water Date Prep: 07/14/2017
PSS Sample ID: 17071008-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	07/14/17 15:53

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144332 Matrix: Water Date Prep: 07/12/2017
PSS Sample ID: 17071008-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	104		86-111	%	07/12/17 11:18
Dibromofluoromethane	104		91-119	%	07/12/17 11:18
Toluene-D8	99		90-117	%	07/12/17 11:18

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071008

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 144332 Matrix: Water Date Prep: 07/12/17

MB Sample Id: 66946-1-BLK LCS Sample Id: 66946-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	51.10	102	29-149	ug/L	07/12/17 09:16	
Benzene	<1.000	50.00	52.66	105	85-123	ug/L	07/12/17 09:16	
Bromochloromethane	<1.000	50.00	50.34	101	82-136	ug/L	07/12/17 09:16	
Bromodichloromethane	<1.000	50.00	49.35	99	88-133	ug/L	07/12/17 09:16	
Bromoform	<5.000	50.00	49.42	99	80-126	ug/L	07/12/17 09:16	
Bromomethane	<1.000	50.00	45.25	91	64-139	ug/L	07/12/17 09:16	
2-Butanone (MEK)	<10.00	50.00	48.32	97	39-135	ug/L	07/12/17 09:16	
Carbon Disulfide	<10.00	50.00	52.51	105	85-124	ug/L	07/12/17 09:16	
Carbon Tetrachloride	<1.000	50.00	50.83	102	81-138	ug/L	07/12/17 09:16	
Chlorobenzene	<1.000	50.00	53.65	107	85-120	ug/L	07/12/17 09:16	
Chloroethane	<1.000	50.00	48.65	97	75-129	ug/L	07/12/17 09:16	
Chloroform	<1.000	50.00	50.89	102	85-128	ug/L	07/12/17 09:16	
Chloromethane	<1.000	50.00	53.23	106	60-139	ug/L	07/12/17 09:16	
Cyclohexane	<10.00	50.00	50.36	101	55-131	ug/L	07/12/17 09:16	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	49.44	99	69-127	ug/L	07/12/17 09:16	
Dibromochloromethane	<1.000	50.00	50.08	100	82-127	ug/L	07/12/17 09:16	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.60	99	82-121	ug/L	07/12/17 09:16	
1,2-Dichlorobenzene	<1.000	50.00	53.28	107	82-123	ug/L	07/12/17 09:16	
1,3-Dichlorobenzene	<1.000	50.00	52.84	106	81-123	ug/L	07/12/17 09:16	
1,4-Dichlorobenzene	<1.000	50.00	52.78	106	81-121	ug/L	07/12/17 09:16	
Dichlorodifluoromethane	<1.000	50.00	53.34	107	69-147	ug/L	07/12/17 09:16	
1,1-Dichloroethane	<1.000	50.00	51.77	104	83-123	ug/L	07/12/17 09:16	
1,2-Dichloroethane	<1.000	50.00	52.83	106	86-138	ug/L	07/12/17 09:16	
1,1-Dichloroethene	<1.000	50.00	47.80	96	85-127	ug/L	07/12/17 09:16	
cis-1,2-Dichloroethene	<1.000	50.00	51.12	102	87-127	ug/L	07/12/17 09:16	
1,2-Dichloropropane	<1.000	50.00	50.15	100	79-125	ug/L	07/12/17 09:16	
cis-1,3-Dichloropropene	<1.000	50.00	48.19	96	79-131	ug/L	07/12/17 09:16	
trans-1,3-Dichloropropene	<1.000	50.00	47.95	96	82-133	ug/L	07/12/17 09:16	
trans-1,2-Dichloroethene	<1.000	50.00	47.91	96	85-125	ug/L	07/12/17 09:16	
Ethylbenzene	<1.000	50.00	52.95	106	83-123	ug/L	07/12/17 09:16	
2-Hexanone	<5.000	50.00	47.77	96	37-137	ug/L	07/12/17 09:16	
Isopropylbenzene	<1.000	50.00	53.79	108	70-131	ug/L	07/12/17 09:16	
Methyl Acetate	<10.00	50.00	42.86	86	69-127	ug/L	07/12/17 09:16	
Methylcyclohexane	<10.00	50.00	49.17	98	75-129	ug/L	07/12/17 09:16	
Methylene Chloride	<1.000	50.00	51.27	103	86-124	ug/L	07/12/17 09:16	
4-Methyl-2-Pentanone	<5.000	50.00	48.63	97	39-143	ug/L	07/12/17 09:16	
Methyl-t-butyl ether	<1.000	50.00	48.56	97	75-134	ug/L	07/12/17 09:16	
Naphthalene	<1.000	50.00	54.15	108	61-118	ug/L	07/12/17 09:16	
Styrene	<1.000	50.00	54.11	108	80-120	ug/L	07/12/17 09:16	
1,1,2,2-Tetrachloroethane	<1.000	50.00	53.15	106	64-125	ug/L	07/12/17 09:16	
Tetrachloroethene	<1.000	50.00	49.14	98	83-138	ug/L	07/12/17 09:16	
Toluene	<1.000	50.00	48.19	96	88-126	ug/L	07/12/17 09:16	
1,2,3-Trichlorobenzene	<1.000	50.00	55.89	112	75-124	ug/L	07/12/17 09:16	
1,2,4-Trichlorobenzene	<1.000	50.00	54.05	108	77-131	ug/L	07/12/17 09:16	
1,1,1-Trichloroethane	<1.000	50.00	53.59	107	68-146	ug/L	07/12/17 09:16	
1,1,2-Trichloroethane	<1.000	50.00	47.54	95	85-124	ug/L	07/12/17 09:16	
Trichloroethene	<1.000	50.00	53.11	106	87-127	ug/L	07/12/17 09:16	
Trichlorofluoromethane	<5.000	50.00	52.96	106	77-147	ug/L	07/12/17 09:16	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	47.74	95	68-135	ug/L	07/12/17 09:16	
Vinyl Chloride	<1.000	50.00	53.91	108	74-138	ug/L	07/12/17 09:16	
m,p-Xylenes	<2.000	100	100.9	101	84-124	ug/L	07/12/17 09:16	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071008

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144332 Matrix: Water Date Prep: 07/12/17
MB Sample Id: 66946-1-BLK LCS Sample Id: 66946-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	54.62	109	79-126	ug/L	07/12/17 09:16	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	104		99		86-111	%	07/12/17 09:16
Dibromofluoromethane	101		101		91-119	%	07/12/17 09:16
Toluene-D8	97		98		90-117	%	07/12/17 09:16

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 144415 Matrix: Water Date Prep: 07/14/17
MB Sample Id: 66988-1-BLK LCS Sample Id: 66988-1-BKS LCSD Sample Id: 66988-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
1,4-Dioxane (P-Dioxane)	<1.000	30.00	29.74	99	29.23	97	50-150	2	20	ug/L	07/14/17 14:05	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	96		103		98		80-120	%	07/14/17 14:05

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

@ Internal

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 709-6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 31402390.09
SITE LOCATION: Hanover MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 1707108 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * VOCs (8260)	1,4 Dioxane (8260 SIM)	REMARKS
1	Influent USP-1	7/10/17	1130	GW	6	G		X	X	
2	Effluent USP-1	7/10/17	1108	WW	3	G			X	
3	TB-070117	—	—	—	2	—		X		

(5)

Relinquished By: (1)	Date	Time	Received By:
	7/10/17	1245	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER

# of Coolers: 1 Temp Blank 14°C
Custody Seal: ABS
Ice Present: PRES Temp: 9°-14°C
Shipping Carrier: Client

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17071008	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	07/10/2017 12:45:00 PM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	08/14/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	14
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 3 Total No. of Containers Received 11

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Barb Weber Date: 07/10/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 07/10/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17080304

Project Manager: Eric Johnson

Project Name : Kop-Flex

Project Location: Hanover, MD

August 10, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

August 10, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17080304**
Project Name: Kop-Flex
Project Location: Hanover, MD

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17080304**. This report has been revised to correct the sample identification for sample 002. The sample results are not impacted by this revision. This report cancels and supersedes report version 1.000 dated August 10, 2017.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on September 7, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17080304

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/03/2017 at 11:25 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17080304-001	Effluent VSP-4	WASTE WATER	08/03/17 08:05
17080304-002	Influent VSP-1	WASTE WATER	08/03/17 08:05
17080304-003	TB-080317	WATER	08/03/17 11:25

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080304

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: Effluent VSP-4 **Date/Time Sampled: 08/03/2017 08:05** **PSS Sample ID: 17080304-001**

Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	ND	ug/L	1.0		1	08/07/17	08/07/17 18:55	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080304

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD

Sample ID: Influent VSP-1 **Date/Time Sampled: 08/03/2017 08:05** **PSS Sample ID: 17080304-002**
Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
Benzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Bromochloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Bromodichloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Bromoform	ND	ug/L	5.0		1	08/03/17	08/03/17 22:05	1011
Bromomethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
2-Butanone (MEK)	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
Carbon Disulfide	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Chlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Chloroethane	**1.8**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Chloroform	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Chloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Cyclohexane	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	08/03/17	08/03/17 22:05	1011
Dibromochloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,1-Dichloroethane	**49**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2-Dichloroethane	**2.0**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,1-Dichloroethene	**230**	ug/L	5.0		5	08/03/17	08/04/17 20:09	1011
cis-1,2-Dichloroethene	**1.3**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Ethylbenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080304

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD

Sample ID: Influent VSP-1 **Date/Time Sampled: 08/03/2017 08:05** **PSS Sample ID: 17080304-002**
Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	08/03/17	08/03/17 22:05	1011
Isopropylbenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Methyl Acetate	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
Methylcyclohexane	ND	ug/L	10		1	08/03/17	08/03/17 22:05	1011
Methylene Chloride	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	08/03/17	08/03/17 22:05	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Naphthalene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Styrene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Tetrachloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Toluene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,1,1-Trichloroethane	**41**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Trichloroethene	**2.0**	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	08/03/17	08/03/17 22:05	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
Vinyl Chloride	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011
m,p-Xylenes	ND	ug/L	2.0		1	08/03/17	08/03/17 22:05	1011
o-Xylene	ND	ug/L	1.0		1	08/03/17	08/03/17 22:05	1011

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	**170**	ug/L	10		10	08/07/17	08/07/17 19:18	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080304

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD

Sample ID: TB-080317 **Date/Time Sampled: 08/03/2017 11:25** **PSS Sample ID: 17080304-003**
Matrix: WATER **Date/Time Received: 08/03/2017 11:25**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
Benzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Bromochloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Bromodichloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Bromoform	ND	ug/L	5.0		1	08/03/17	08/03/17 21:42	1011
Bromomethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
2-Butanone (MEK)	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
Carbon Disulfide	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
Carbon Tetrachloride	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Chlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Chloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Chloroform	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Chloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Cyclohexane	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	08/03/17	08/03/17 21:42	1011
Dibromochloromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,3-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Dichlorodifluoromethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,4-Dichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,1-Dichloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2-Dichloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,1-Dichloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2-Dichloropropane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Ethylbenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080304

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex

Project Location: Hanover, MD

Sample ID: TB-080317 **Date/Time Sampled: 08/03/2017 11:25** **PSS Sample ID: 17080304-003**

Matrix: WATER **Date/Time Received: 08/03/2017 11:25**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	08/03/17	08/03/17 21:42	1011
Isopropylbenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Methyl Acetate	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
Methylcyclohexane	ND	ug/L	10		1	08/03/17	08/03/17 21:42	1011
Methylene Chloride	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	08/03/17	08/03/17 21:42	1011
Methyl-t-butyl ether	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Naphthalene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Styrene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Tetrachloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Toluene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,1,1-Trichloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
1,1,2-Trichloroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Trichloroethene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	08/03/17	08/03/17 21:42	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
Vinyl Chloride	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011
m,p-Xylenes	ND	ug/L	2.0		1	08/03/17	08/03/17 21:42	1011
o-Xylene	ND	ug/L	1.0		1	08/03/17	08/03/17 21:42	1011

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17080304

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SW-846 8260 B-Modified: 1,4-Dioxane

Analytical Data Package Information Summary

Work Order(s): **17080304**
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop-Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	Influent VSP-1	Initial	17080304-002	1011	W	67251	144977	08/03/2017	08/03/2017 14:36	08/03/2017 22:05
	TB-080317	Initial	17080304-003	1011	W	67251	144977	08/03/2017	08/03/2017 14:36	08/03/2017 21:42
	67251-1-BKS	BKS	67251-1-BKS	1011	W	67251	144977	--------	08/03/2017 14:36	08/03/2017 15:30
	67251-1-BLK	BLK	67251-1-BLK	1011	W	67251	144977	--------	08/03/2017 14:36	08/03/2017 16:12
	442600-SHAFT16-GW-03 S	MS	17080208-001 S	1011	W	67251	144977	08/02/2017	08/03/2017 14:36	08/03/2017 17:39
	442600-SHAFT16-GW-03 SD	MSD	17080208-001 SD	1011	W	67251	144977	08/02/2017	08/03/2017 14:36	08/03/2017 18:00
	67259-1-BKS	BKS	67259-1-BKS	1011	W	67259	145011	--------	08/04/2017 10:35	08/04/2017 13:30
	67259-1-BLK	BLK	67259-1-BLK	1011	W	67259	145011	--------	08/04/2017 10:35	08/04/2017 14:12
	GOTN W-1 S	MS	17080314-001 S	1011	W	67259	145011	08/02/2017	08/04/2017 10:35	08/04/2017 17:15
	GOTN W-1 SD	MSD	17080314-001 SD	1011	W	67259	145011	08/02/2017	08/04/2017 10:35	08/04/2017 17:36
	Influent VSP-1	Reanalysis	17080304-002	1011	W	67251	145011	08/03/2017	08/03/2017 14:36	08/04/2017 20:09
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17080304-001	1011	W	67280	145067	08/03/2017	08/07/2017 11:53	08/07/2017 18:55
	67280-1-BKS	BKS	67280-1-BKS	1011	W	67280	145067	--------	08/07/2017 11:53	08/07/2017 17:05
	67280-1-BLK	BLK	67280-1-BLK	1011	W	67280	145067	--------	08/07/2017 11:53	08/07/2017 18:34
	67280-1-BSD	BSD	67280-1-BSD	1011	W	67280	145067	--------	08/07/2017 11:53	08/07/2017 17:27
	Influent VSP-1	Reanalysis	17080304-002	1011	W	67280	145067	08/03/2017	08/07/2017 11:53	08/07/2017 19:18

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080304

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 145067 Matrix: Waste Water Date Prep: 08/07/2017
PSS Sample ID: 17080304-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	08/07/17 18:55

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144977 Matrix: Waste Water Date Prep: 08/03/2017
PSS Sample ID: 17080304-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	92		86-111	%	08/03/17 22:05
Dibromofluoromethane	102		91-119	%	08/03/17 22:05
Toluene-D8	98		90-117	%	08/03/17 22:05

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 145067 Matrix: Waste Water Date Prep: 08/07/2017
PSS Sample ID: 17080304-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	99		80-120	%	08/07/17 19:40

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144977 Matrix: Water Date Prep: 08/03/2017
PSS Sample ID: 17080304-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	93		86-111	%	08/03/17 21:42
Dibromofluoromethane	101		91-119	%	08/03/17 21:42
Toluene-D8	101		90-117	%	08/03/17 21:42

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080304

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 144977 Matrix: Water Date Prep: 08/03/17

MB Sample Id: 67251-1-BLK LCS Sample Id: 67251-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	47.90	96	29-149	ug/L	08/03/17 15:30	
Benzene	<1.000	50.00	55.00	110	85-123	ug/L	08/03/17 15:30	
Bromochloromethane	<1.000	50.00	55.73	111	82-136	ug/L	08/03/17 15:30	
Bromodichloromethane	<1.000	50.00	57.20	114	88-133	ug/L	08/03/17 15:30	
Bromoform	<5.000	50.00	59.12	118	80-126	ug/L	08/03/17 15:30	
Bromomethane	<1.000	50.00	51.01	102	64-139	ug/L	08/03/17 15:30	
2-Butanone (MEK)	<10.00	50.00	52.01	104	39-135	ug/L	08/03/17 15:30	
Carbon Disulfide	<10.00	50.00	53.49	107	85-124	ug/L	08/03/17 15:30	
Carbon Tetrachloride	<1.000	50.00	56.04	112	81-138	ug/L	08/03/17 15:30	
Chlorobenzene	<1.000	50.00	56.24	112	85-120	ug/L	08/03/17 15:30	
Chloroethane	<1.000	50.00	48.47	97	75-129	ug/L	08/03/17 15:30	
Chloroform	<1.000	50.00	52.08	104	85-128	ug/L	08/03/17 15:30	
Chloromethane	<1.000	50.00	49.51	99	60-139	ug/L	08/03/17 15:30	
Cyclohexane	<10.00	50.00	53.44	107	55-131	ug/L	08/03/17 15:30	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.37	91	69-127	ug/L	08/03/17 15:30	
Dibromochloromethane	<1.000	50.00	54.13	108	82-127	ug/L	08/03/17 15:30	
1,2-Dibromoethane (EDB)	<1.000	50.00	56.72	113	82-121	ug/L	08/03/17 15:30	
1,2-Dichlorobenzene	<1.000	50.00	53.60	107	82-123	ug/L	08/03/17 15:30	
1,3-Dichlorobenzene	<1.000	50.00	52.86	106	81-123	ug/L	08/03/17 15:30	
1,4-Dichlorobenzene	<1.000	50.00	51.96	104	81-121	ug/L	08/03/17 15:30	
Dichlorodifluoromethane	<1.000	50.00	66.36	133	69-147	ug/L	08/03/17 15:30	
1,1-Dichloroethane	<1.000	50.00	54.23	108	83-123	ug/L	08/03/17 15:30	
1,2-Dichloroethane	<1.000	50.00	53.79	108	86-138	ug/L	08/03/17 15:30	
1,1-Dichloroethene	<1.000	50.00	54.20	108	85-127	ug/L	08/03/17 15:30	
cis-1,2-Dichloroethene	<1.000	50.00	56.63	113	87-127	ug/L	08/03/17 15:30	
1,2-Dichloropropane	<1.000	50.00	53.93	108	79-125	ug/L	08/03/17 15:30	
cis-1,3-Dichloropropene	<1.000	50.00	56.88	114	79-131	ug/L	08/03/17 15:30	
trans-1,3-Dichloropropene	<1.000	50.00	58.21	116	82-133	ug/L	08/03/17 15:30	
trans-1,2-Dichloroethene	<1.000	50.00	56.78	114	85-125	ug/L	08/03/17 15:30	
Ethylbenzene	<1.000	50.00	54.79	110	83-123	ug/L	08/03/17 15:30	
2-Hexanone	<5.000	50.00	49.80	100	37-137	ug/L	08/03/17 15:30	
Isopropylbenzene	<1.000	50.00	51.32	103	70-131	ug/L	08/03/17 15:30	
Methyl Acetate	<10.00	50.00	33.64	67	69-127	ug/L	08/03/17 15:30	L
Methylcyclohexane	<10.00	50.00	59.14	118	75-129	ug/L	08/03/17 15:30	
Methylene Chloride	<1.000	50.00	56.55	113	86-124	ug/L	08/03/17 15:30	
4-Methyl-2-Pentanone	<5.000	50.00	47.88	96	39-143	ug/L	08/03/17 15:30	
Methyl-t-butyl ether	<1.000	50.00	55.51	111	75-134	ug/L	08/03/17 15:30	
Naphthalene	<1.000	50.00	52.32	105	61-118	ug/L	08/03/17 15:30	
Styrene	<1.000	50.00	57.24	114	80-120	ug/L	08/03/17 15:30	
1,1,2,2-Tetrachloroethane	<1.000	50.00	49.42	99	64-125	ug/L	08/03/17 15:30	
Tetrachloroethene	<1.000	50.00	62.84	126	83-138	ug/L	08/03/17 15:30	
Toluene	<1.000	50.00	57.22	114	88-126	ug/L	08/03/17 15:30	
1,2,3-Trichlorobenzene	<1.000	50.00	55.00	110	75-124	ug/L	08/03/17 15:30	
1,2,4-Trichlorobenzene	<1.000	50.00	55.67	111	77-131	ug/L	08/03/17 15:30	
1,1,1-Trichloroethane	<1.000	50.00	57.92	116	68-146	ug/L	08/03/17 15:30	
1,1,2-Trichloroethane	<1.000	50.00	57.32	115	85-124	ug/L	08/03/17 15:30	
Trichloroethene	<1.000	50.00	57.28	115	87-127	ug/L	08/03/17 15:30	
Trichlorofluoromethane	<5.000	50.00	60.13	120	77-147	ug/L	08/03/17 15:30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	55.35	111	68-135	ug/L	08/03/17 15:30	
Vinyl Chloride	<1.000	50.00	58.16	116	74-138	ug/L	08/03/17 15:30	
m,p-Xylenes	<2.000	100	114.6	115	84-124	ug/L	08/03/17 15:30	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080304

WSP USA - Herndon
Kop-Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 144977 Matrix: Water Date Prep: 08/03/17
MB Sample Id: 67251-1-BLK LCS Sample Id: 67251-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	56.91	114	79-126	ug/L	08/03/17 15:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	93		88		86-111	%	08/03/17 15:30
Dibromofluoromethane	103		100		91-119	%	08/03/17 15:30
Toluene-D8	100		100		90-117	%	08/03/17 15:30

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 145011 Matrix: Water Date Prep: 08/04/17
MB Sample Id: 67259-1-BLK LCS Sample Id: 67259-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
1,1-Dichloroethene	<1.000	50.00	55.29	111	85-127	ug/L	08/04/17 13:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	94		93		86-111	%	08/04/17 13:30
Dibromofluoromethane	101		101		91-119	%	08/04/17 13:30
Toluene-D8	97		99		90-117	%	08/04/17 13:30

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 145067 Matrix: Water Date Prep: 08/07/17
MB Sample Id: 67280-1-BLK LCS Sample Id: 67280-1-BKS LCSD Sample Id: 67280-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
1,4-Dioxane (P-Dioxane)	<1.000	30.00	30.07	100	31.66	106	50-150	5	20	ug/L	08/07/17 17:05	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	99		99		100		80-120	%	08/07/17 17:05

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

Internal monthly August

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC.: Herndon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 705-6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kopflex PROJECT NO.:
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kaplan DW CERT NO.:

PSS Work Order #: 17080304 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	HCl	HCl										REMARKS
							Analysis/ Method Required (3) *	1,4 Dioxane (8260 SIM)	VOCs (8260)										
	Effluent VSP-4	8/3/17	~~0805~~ 0805	WW	3	G		X											
	Influent VSP ~~Dup~~ 1	8/3/17	0805	WW	6	G		X	X										
	TB-080317	—	—	—	2	G			X										

(5)

Relinquished By: (1)	Date	Time	Received By:
	8/3/17	1125	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4) *Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1 Temp Blank = 12°C
Custody Seal: ABS
Ice Present: PRES Temp: 9°-12°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE: ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17080304	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	08/03/2017 11:25:00 AM
Project Name	Kop-Flex	**Delivered By**	Client
Disposal Date	09/07/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	12
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 3 Total No. of Containers Received 11

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 08/03/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 08/03/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17080305

Project Manager: Eric Johnson
Project Name : Kop-Flex
Project Location: Hanover, MD
Project ID : 31400390-09

August 10, 2017

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PHASE SEPARATION SCIENCE, INC.

August 10, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17080305**
Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID.: 31400390-09

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17080305**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on September 7, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17080305

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/03/2017 at 11:25 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17080305-001	Effluent VSP-4	WASTE WATER	08/03/17 07:55

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080305

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 08/03/2017 07:55** **PSS Sample ID: 17080305-001**
Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

Dissolved Metals — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**1.1**	ug/L	1.0		1	08/04/17	08/05/17 01:55	1051
Lead	ND	ug/L	1.0		1	08/04/17	08/05/17 01:55	1051
Nickel	ND	ug/L	1.0		1	08/04/17	08/05/17 01:55	1051
Zinc	ND	ug/L	20		1	08/04/17	08/08/17 23:04	1051

Total Metals + Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**5.0**	ug/L	1.0		1	08/03/17	08/04/17 23:51	1051
Lead	ND	ug/L	1.0		1	08/03/17	08/04/17 23:51	1051
Nickel	**10.1**	ug/L	1.00		1	08/03/17	08/04/17 23:51	1051
Zinc	**22.8**	ug/L	20.0		1	08/03/17	08/04/17 23:51	1051
Hardness (Ca & Mg)	**15.0**	mg/L	0.660		1	08/03/17	08/04/17 23:51	1051

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CERTIFICATE OF ANALYSIS

No: 17080305

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 08/03/2017 07:55** **PSS Sample ID: 17080305-001**
Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=2

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Chloromethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Vinyl Chloride	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Bromomethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Chloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Trichlorofluoromethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,1-Dichloroethene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Methylene Chloride	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
trans-1,2-dichloroethene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,1-Dichloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Chloroform	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,1,1-Trichloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Carbon Tetrachloride	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Benzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,2-Dichloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Trichloroethene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,2-Dichloropropane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Bromodichloromethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Toluene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
trans-1,3-dichloropropene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,1,2-Trichloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Tetrachloroethylene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Dibromochloromethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Chlorobenzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Ethylbenzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
Bromoform	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,3-Dichlorobenzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17080305

WSP USA - Herndon, Herndon, VA

August 10, 2017

Project Name: Kop-Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 08/03/2017 07:55** **PSS Sample ID: 17080305-001**
Matrix: WASTE WATER **Date/Time Received: 08/03/2017 11:25**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624
pH=2

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011
1,2-Dichlorobenzene	ND	ug/L	5.0		1	08/04/17	08/04/17 16:15	1011

Total Suspended Solids Analytical Method: SM 2540D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	08/04/17	08/04/17 12:08	1061

Biochemical Oxygen Demand Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	5.0		08/03/17	08/08/17 14:10	4005

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop-Flex

Work Order Number(s): 17080305
Project ID: 31400390-09

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.
Acrolein and acrylonitrile not required for EPA 624 samples.

17080305: Analyses associated with analyst code 4005 were performed by Enviro-Chem Laboratories, Inc.

Analytical:

Volatile Organics Compounds (TVO)

Batch: 145021

Surrogate exceedances identified; see surrogate summary form.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SM 5210B -2011

Analytical Data Package Information Summary

Work Order(s): 17080305
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop-Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	Effluent VSP-4	Initial	17080305-001	1051	W	67240	145092	08/03/2017	08/03/2017 14:11	08/04/2017 23:51
	67240-1-BKS	BKS	67240-1-BKS	1051	W	67240	145092	--------	08/03/2017 14:11	08/04/2017 21:36
	67240-1-BLK	BLK	67240-1-BLK	1051	W	67240	145092	--------	08/03/2017 14:11	08/04/2017 21:29
	442600-SHAFT01-GW-01 S	MS	17080207-001 S	1051	W	67240	145092	08/02/2017	08/03/2017 14:11	08/04/2017 21:48
	442600-SHAFT01-GW-01 SD	MSD	17080207-001 SD	1051	W	67240	145092	08/02/2017	08/03/2017 14:11	08/04/2017 21:55
EPA 200.8	Effluent VSP-4	Initial	17080305-001	1051	W	67257	145035	08/03/2017	08/04/2017 18:49	08/05/2017 01:55
	67257-1-BKS	BKS	67257-1-BKS	1051	W	67257	145035	--------	08/04/2017 18:49	08/05/2017 01:48
	67257-1-BLK	BLK	67257-1-BLK	1051	W	67257	145035	--------	08/04/2017 18:49	08/05/2017 01:42
	Effluent VSP-4 S	MS	17080305-001 S	1051	W	67257	145035	08/03/2017	08/04/2017 18:49	08/05/2017 02:01
	Effluent VSP-4 SD	MSD	17080305-001 SD	1051	W	67257	145035	08/03/2017	08/04/2017 18:49	08/05/2017 02:08
	67257-1-BKS	Reanalysis	67257-1-BKS	1051	W	67257	145099	--------	08/04/2017 18:49	08/08/2017 22:57
	67257-1-BLK	Reanalysis	67257-1-BLK	1051	W	67257	145099	--------	08/04/2017 18:49	08/08/2017 22:51
	Effluent VSP-4	Reanalysis	17080305-001	1051	W	67257	145099	08/03/2017	08/04/2017 18:49	08/08/2017 23:04
EPA 624	Effluent VSP-4	Initial	17080305-001	1011	W	67263	145021	08/03/2017	08/04/2017 11:40	08/04/2017 16:15
	67263-1-BKS	BKS	67263-1-BKS	1011	W	67263	145021	--------	08/04/2017 11:40	08/04/2017 13:36
	67263-1-BLK	BLK	67263-1-BLK	1011	W	67263	145021	--------	08/04/2017 11:40	08/04/2017 14:16
	Effluent VSP-4 S	MS	17080305-001 S	1011	W	67263	145021	08/03/2017	08/04/2017 11:40	08/04/2017 16:55
	Effluent VSP-4 SD	MSD	17080305-001 SD	1011	W	67263	145021	08/03/2017	08/04/2017 11:40	08/04/2017 17:35
SM 2540D -2011	Effluent VSP-4	Initial	17080305-001	1061	W	144980	144980	08/03/2017	08/04/2017 12:08	08/04/2017 12:08
	144980-1-BLK	BLK	144980-1-BLK	1061	W	144980	144980	--------	08/04/2017 12:08	08/04/2017 12:08
	MW-1 D	MD	17080301-001 D	1061	W	144980	144980	08/02/2017	08/04/2017 12:08	08/04/2017 12:08
	Middle Discharge D	MD	17080406-002 D	1061	W	144980	144980	08/03/2017	08/04/2017 12:08	08/04/2017 12:08
SM 5210B -2011	Effluent VSP-4	Initial	17080305-001	4005	W	145113	145113	08/03/2017	08/03/2017 00:00	08/08/2017 14:10

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080305

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 145021 Matrix: Waste Water Date Prep: 08/04/2017
PSS Sample ID: 17080305-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	110		87-114	%	08/04/17 16:15
4-Bromofluorobenzene	129	*	90-114	%	08/04/17 16:15
Toluene-D8	97		93-108	%	08/04/17 16:15

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080305

WSP USA - Herndon
Kop-Flex

Analytical Method: SM 2540D -2011
Seq Number: 144980 Matrix: Water
MB Sample Id: 144980-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	08/04/17 12:08	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 145092 Matrix: Water Date Prep: 08/03/17
MB Sample Id: 67240-1-BLK LCS Sample Id: 67240-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	408	102	85-115	ug/L	08/04/17 21:36	
Copper	<1.000	40.00	42.23	106	85-115	ug/L	08/04/17 21:36	
Lead	<1.000	40.00	39.57	99	85-115	ug/L	08/04/17 21:36	
Magnesium	<100	400	425.1	106	85-115	ug/L	08/04/17 21:36	
Nickel	<1.000	40.00	41.45	104	85-115	ug/L	08/04/17 21:36	
Zinc	<20.00	200	211.7	106	85-115	ug/L	08/04/17 21:36	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 145035 Matrix: Water Date Prep: 08/04/17
MB Sample Id: 67257-1-BLK LCS Sample Id: 67257-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	38.77	97	85-115	ug/L	08/05/17 01:48	
Lead	<1.000	40.00	37.94	95	85-115	ug/L	08/08/17 22:57	
Nickel	<1.000	40.00	37.95	95	85-115	ug/L	08/05/17 01:48	
Zinc	<20.00	200	195.5	98	85-115	ug/L	08/05/17 01:48	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 145035 Matrix: Waste Water Date Prep: 08/04/17
Parent Sample Id: 17080305-001 MS Sample Id: 17080305-001 S MSD Sample Id: 17080305-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	1.080	40.00	41.91	102	40.29	98	70-130	4	25	ug/L	08/05/17 02:01	
Lead	<1.000	40.00	21.53	54	30.87	77	70-130	36	25	ug/L	08/05/17 02:01	XF
Nickel	<1.000	40.00	40.54	101	39.34	98	70-130	3	25	ug/L	08/05/17 02:01	
Zinc	258.4	200	1906	824	454.5	98	70-130	123	25	ug/L	08/05/17 02:01	XF

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080305

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 145021 Matrix: Water Date Prep: 08/04/17

MB Sample Id: 67263-1-BLK LCS Sample Id: 67263-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	66.48	111	51-139	ug/L	08/04/17 13:36	
Chloromethane	<5.000	60.00	53.70	90	56-144	ug/L	08/04/17 13:36	
Vinyl Chloride	<5.000	60.00	71.70	120	46-157	ug/L	08/04/17 13:36	
Bromomethane	<5.000	60.00	64.09	107	63-134	ug/L	08/04/17 13:36	
Chloroethane	<5.000	60.00	55.64	93	56-143	ug/L	08/04/17 13:36	
Trichlorofluoromethane	<5.000	60.00	69.03	115	56-138	ug/L	08/04/17 13:36	
1,1-Dichloroethene	<5.000	60.00	64.55	108	63-134	ug/L	08/04/17 13:36	
Methylene Chloride	<5.000	60.00	61.24	102	65-126	ug/L	08/04/17 13:36	
trans-1,2-dichloroethene	<5.000	60.00	64.61	108	67-129	ug/L	08/04/17 13:36	
1,1-Dichloroethane	<5.000	60.00	65.93	110	66-131	ug/L	08/04/17 13:36	
Chloroform	<5.000	60.00	64.08	107	69-130	ug/L	08/04/17 13:36	
1,1,1-Trichloroethane	<5.000	60.00	64.61	108	66-129	ug/L	08/04/17 13:36	
Carbon Tetrachloride	<5.000	60.00	65.16	109	70-133	ug/L	08/04/17 13:36	
Benzene	<5.000	60.00	66.51	111	69-127	ug/L	08/04/17 13:36	
1,2-Dichloroethane	<5.000	60.00	64.79	108	62-133	ug/L	08/04/17 13:36	
Trichloroethene	<5.000	60.00	66.10	110	71-127	ug/L	08/04/17 13:36	
1,2-Dichloropropane	<5.000	60.00	66.33	111	67-133	ug/L	08/04/17 13:36	
Bromodichloromethane	<5.000	60.00	67.05	112	63-132	ug/L	08/04/17 13:36	
2-Chloroethyl Vinyl Ether	<5.000	60.00	38.96	65	21-140	ug/L	08/04/17 13:36	
cis-1,3-Dichloropropene	<5.000	60.00	59.44	99	65-128	ug/L	08/04/17 13:36	
Toluene	<5.000	60.00	66.86	111	67-130	ug/L	08/04/17 13:36	
trans-1,3-dichloropropene	<5.000	60.00	59.42	99	63-127	ug/L	08/04/17 13:36	
1,1,2-Trichloroethane	<5.000	60.00	67.44	112	62-136	ug/L	08/04/17 13:36	
Tetrachloroethylene	<5.000	60.00	62.36	104	64-135	ug/L	08/04/17 13:36	
Dibromochloromethane	<5.000	60.00	68.66	114	65-126	ug/L	08/04/17 13:36	
Chlorobenzene	<5.000	60.00	69.80	116	70-127	ug/L	08/04/17 13:36	
Ethylbenzene	<5.000	60.00	72.95	122	71-131	ug/L	08/04/17 13:36	
Bromoform	<5.000	60.00	70.76	118	58-128	ug/L	08/04/17 13:36	
1,1,2,2-Tetrachloroethane	<5.000	60.00	76.45	127	63-134	ug/L	08/04/17 13:36	
1,3-Dichlorobenzene	<5.000	60.00	74.65	124	67-128	ug/L	08/04/17 13:36	
1,4-Dichlorobenzene	<5.000	60.00	72.63	121	67-127	ug/L	08/04/17 13:36	
1,2-Dichlorobenzene	<5.000	60.00	75.34	126	67-126	ug/L	08/04/17 13:36	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	109		108		87-114	%	08/04/17 13:36
4-Bromofluorobenzene	128	*	101		90-114	%	08/04/17 13:36
Toluene-D8	97		98		93-108	%	08/04/17 13:36

PHASE SEPARATION SCIENCE, INC.

QC Summary 17080305

WSP USA - Herndon
Kop-Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 145021 Matrix: Waste Water Date Prep: 08/04/17

Parent Sample Id: 17080305-001 MS Sample Id: 17080305-001 S MSD Sample Id: 17080305-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	79.60	133	57.78	96	38-157	32	25	ug/L	08/04/17 16:55	F
Chloromethane	<5.000	60.00	71.02	118	53.10	89	43-155	29	25	ug/L	08/04/17 16:55	F
Vinyl Chloride	<5.000	60.00	86.16	144	67.40	112	48-154	24	25	ug/L	08/04/17 16:55	
Bromomethane	<5.000	60.00	79.24	132	58.58	98	52-143	30	25	ug/L	08/04/17 16:55	F
Chloroethane	<5.000	60.00	67.80	113	50.74	85	47-150	29	25	ug/L	08/04/17 16:55	F
Trichlorofluoromethane	<5.000	60.00	84.43	141	57.99	97	59-142	37	25	ug/L	08/04/17 16:55	F
1,1-Dichloroethene	<5.000	60.00	78.69	131	56.12	94	55-138	33	25	ug/L	08/04/17 16:55	F
Methylene Chloride	<5.000	60.00	76.92	128	56.00	93	60-133	31	25	ug/L	08/04/17 16:55	F
trans-1,2-dichloroethene	<5.000	60.00	80.19	134	58.29	97	62-133	32	25	ug/L	08/04/17 16:55	XF
1,1-Dichloroethane	<5.000	60.00	82.08	137	58.95	98	62-134	33	25	ug/L	08/04/17 16:55	XF
Chloroform	<5.000	60.00	81.92	137	59.79	100	53-142	31	25	ug/L	08/04/17 16:55	F
1,1,1-Trichloroethane	<5.000	60.00	81.49	136	57.64	96	63-135	34	25	ug/L	08/04/17 16:55	XF
Carbon Tetrachloride	<5.000	60.00	80.98	135	56.74	95	62-134	35	25	ug/L	08/04/17 16:55	XF
Benzene	<5.000	60.00	83.43	139	59.80	100	56-138	33	25	ug/L	08/04/17 16:55	XF
1,2-Dichloroethane	<5.000	60.00	82.99	138	58.80	98	61-132	34	25	ug/L	08/04/17 16:55	XF
Trichloroethene	<5.000	60.00	82.21	137	59.04	98	57-142	33	25	ug/L	08/04/17 16:55	F
1,2-Dichloropropane	<5.000	60.00	84.92	142	60.89	101	56-141	33	25	ug/L	08/04/17 16:55	XF
Bromodichloromethane	<5.000	60.00	86.11	144	62.02	103	52-141	33	25	ug/L	08/04/17 16:55	XF
2-Chloroethyl Vinyl Ether	<5.000	60.00	<5.000	0	<5.000	0	21-140	NC	25	ug/L	08/04/17 16:55	X
cis-1,3-Dichloropropene	<5.000	60.00	77.04	128	54.07	90	29-156	35	25	ug/L	08/04/17 16:55	F
Toluene	<5.000	60.00	85.06	142	60.37	101	55-141	34	25	ug/L	08/04/17 16:55	XF
trans-1,3-dichloropropene	<5.000	60.00	77.16	129	53.83	90	27-156	36	25	ug/L	08/04/17 16:55	F
1,1,2-Trichloroethane	<5.000	60.00	88.31	147	64.64	108	50-151	31	25	ug/L	08/04/17 16:55	F
Tetrachloroethylene	<5.000	60.00	78.10	130	55.51	93	43-148	34	25	ug/L	08/04/17 16:55	F
Dibromochloromethane	<5.000	60.00	87.44	146	63.06	105	45-146	32	25	ug/L	08/04/17 16:55	F
Chlorobenzene	<5.000	60.00	88.20	147	63.06	105	57-140	33	25	ug/L	08/04/17 16:55	XF
Ethylbenzene	<5.000	60.00	92.28	154	65.70	110	58-146	34	25	ug/L	08/04/17 16:55	XF
Bromoform	<5.000	60.00	89.80	150	65.63	109	42-145	31	25	ug/L	08/04/17 16:55	XF
1,1,2,2-Tetrachloroethane	<5.000	60.00	96.24	160	71.79	120	48-156	29	25	ug/L	08/04/17 16:55	XF
1,3-Dichlorobenzene	<5.000	60.00	90.98	152	67.19	112	54-141	30	25	ug/L	08/04/17 16:55	XF
1,4-Dichlorobenzene	<5.000	60.00	87.94	147	64.89	108	54-140	30	25	ug/L	08/04/17 16:55	XF
1,2-Dichlorobenzene	<5.000	60.00	89.87	150	66.92	112	53-141	29	25	ug/L	08/04/17 16:55	XF

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	107		106		87-114	%	08/04/17 16:55
4-Bromofluorobenzene	103		103		90-114	%	08/04/17 16:55
Toluene-D8	99		99		93-108	%	08/04/17 16:55

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

NPDES monthly - August

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703) 705 6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Kapflex PROJECT NO.: 340390-69
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Maria Kayden DW CERT NO.:

PSS Work Order #: 17080305 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * BOD5	TSS	Total metals Zn, Cu, Pb, Ni	Hardness (CaCO3)	Dissolved metals Zn, Cu, Pb, Ni	VOCs (624)	REMARKS
1	Effluent VSP-4	8/3/17	0755	WW	1	G		X						
1	Effluent VSP-4	8/3/17	0755	WW	1	G			X					
1	Effluent VSP-4	8/3/17	0755	WW	1	G				X	X			
1	Effluent VSP-4	8/3/17	0755	WW	1	G						X		Lab to filter (4)
1	Effluent VSP-4	8/3/17	0755	WW	3	G							X	

8/3/17

(5)

Relinquished By: (1)	Date	Time	Received By:
	8/3/17	1125	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1 Temp Blank = 12°C
Custody Seal: ABS
Ice Present: PRES Temp: 9-12°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17080305	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	08/03/2017 11:25:00 AM
Project Name	Kop-Flex	**Delivered By**	Client
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	09/07/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	12
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	Maria Kaplan
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 7

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	No
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		No
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

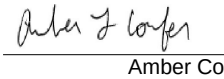
Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.
Acrolein and acrylonitrile not required for EPA 624 samples.

Samples Inspected/Checklist Completed By:  Date: 08/03/2017

Thomas Wingate

PM Review and Approval:  Date: 08/03/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17091107

Project Manager: Eric Johnson

Project Name : Kop Flex

Project Location: Hanover, MD

Project ID : 31400390-09

September 18, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

September 18, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17091107**
Project Name: Kop Flex
Project Location: Hanover, MD
Project ID.: 31400390-09

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17091107**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on October 16, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop Flex

Work Order Number(s): 17091107

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/11/2017 at 11:55 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17091107-001	Effluent VSP-4	WASTE WATER	09/11/17 08:55

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091107

WSP USA - Herndon, Herndon, VA

September 18, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 09/11/2017 08:55** **PSS Sample ID: 17091107-001**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

Dissolved Metals — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**2.7**	ug/L	1.0		1	09/14/17	09/14/17 19:37	1051
Lead	ND	ug/L	1.0		1	09/14/17	09/14/17 19:37	1051
Nickel	**9.7**	ug/L	1.0		1	09/14/17	09/14/17 19:37	1051
Zinc	ND	ug/L	20		1	09/14/17	09/14/17 19:37	1051

Total Metals + Hardness — Analytical Method: EPA 200.8 — Preparation Method: 200.8

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Copper	**4.6**	ug/L	1.0		1	09/13/17	09/13/17 17:43	1051
Lead	ND	ug/L	1.0		1	09/13/17	09/13/17 17:43	1051
Nickel	**10.7**	ug/L	1.00		1	09/13/17	09/13/17 17:43	1051
Zinc	**48.9**	ug/L	20.0		1	09/13/17	09/13/17 17:43	1051
Hardness (Ca & Mg)	**16**	mg/L	0.66		1	09/13/17	09/13/17 17:43	1051

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091107

WSP USA - Herndon, Herndon, VA

September 18, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 09/11/2017 08:55** **PSS Sample ID: 17091107-001**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

Volatile Organics Compounds (TVO) Analytical Method: EPA 624 Preparation Method: 624

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Chloromethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Vinyl Chloride	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Bromomethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Chloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Trichlorofluoromethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,1-Dichloroethene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Methylene Chloride	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
trans-1,2-dichloroethene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,1-Dichloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Chloroform	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,1,1-Trichloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Carbon Tetrachloride	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Benzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,2-Dichloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Trichloroethene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,2-Dichloropropane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Bromodichloromethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
2-Chloroethyl Vinyl Ether	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
cis-1,3-Dichloropropene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Toluene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
trans-1,3-dichloropropene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,1,2-Trichloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Tetrachloroethylene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Dibromochloromethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Chlorobenzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Ethylbenzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
Bromoform	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,3-Dichlorobenzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091107

WSP USA - Herndon, Herndon, VA

September 18, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 09/11/2017 08:55** **PSS Sample ID: 17091107-001**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

Volatile Organics Compounds (TVO) — Analytical Method: EPA 624 — Preparation Method: 624

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dichlorobenzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045
1,2-Dichlorobenzene	ND	ug/L	5.0		1	09/11/17	09/11/17 20:29	1045

Total Suspended Solids — Analytical Method: SM 2540D -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Suspended Solids	ND	mg/L	1.0		1	09/12/17	09/12/17 15:04	1061

Biochemical Oxygen Demand — Analytical Method: SM 5210B -2011

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Biochemical Oxygen Demand, 5 day	ND	mg/L	5.0		09/12/17	09/12/17 11:15	4005

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop Flex

Work Order Number(s): 17091107
Project ID: 31400390-09

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Sample container for BOD not received at Phase, sent directly to sublab 9/11/17.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.
Acrolein and acrylonitrile not required for EPA 624 samples.

17091107: Analyses associated with analyst code 4005 were performed by Enviro-Chem Laboratories, Inc.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SM 5210B -2011

Analytical Data Package Information Summary

Work Order(s): 17091107
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 200.8	Effluent VSP-4	Initial	17091107-001	1051	W	67760	146052	09/11/2017	09/13/2017 10:08	09/13/2017 17:43
	67760-1-BKS	BKS	67760-1-BKS	1051	W	67760	146052	--------	09/13/2017 10:08	09/13/2017 14:23
	67760-1-BLK	BLK	67760-1-BLK	1051	W	67760	146052	--------	09/13/2017 10:08	09/13/2017 14:17
	6 S	MS	17091113-001 S	1051	W	67760	146052	09/11/2017	09/13/2017 10:08	09/13/2017 17:30
	6 SD	MSD	17091113-001 SD	1051	W	67760	146052	09/11/2017	09/13/2017 10:08	09/13/2017 17:37
EPA 200.8	Effluent VSP-4	Initial	17091107-001	1051	W	67789	146101	09/11/2017	09/14/2017 13:57	09/14/2017 19:37
	67789-1-BKS	BKS	67789-1-BKS	1051	W	67789	146101	--------	09/14/2017 13:57	09/14/2017 19:31
	67789-1-BLK	BLK	67789-1-BLK	1051	W	67789	146101	--------	09/14/2017 13:57	09/14/2017 19:24
	Effluent VSP-4 S	MS	17091107-001 S	1051	W	67789	146101	09/11/2017	09/14/2017 13:57	09/14/2017 19:44
	Effluent VSP-4 SD	MSD	17091107-001 SD	1051	W	67789	146101	09/11/2017	09/14/2017 13:57	09/14/2017 19:50
EPA 624	Effluent VSP-4	Initial	17091107-001	1045	W	67782	146065	09/11/2017	09/11/2017 12:51	09/11/2017 20:29
	67782-1-BKS	BKS	67782-1-BKS	1045	W	67782	146065	--------	09/11/2017 12:51	09/11/2017 14:13
	67782-1-BLK	BLK	67782-1-BLK	1045	W	67782	146065	--------	09/11/2017 12:51	09/11/2017 15:42
	11790-EFF-09/17 S	MS	17090805-001 S	1045	W	67782	146065	09/07/2017	09/11/2017 12:51	09/11/2017 16:25
	11790-EFF-09/17 SD	MSD	17090805-001 SD	1045	W	67782	146065	09/07/2017	09/11/2017 12:51	09/11/2017 16:49
SM 2540D -2011	Effluent VSP-4	Initial	17091107-001	1061	W	146007	146007	09/11/2017	09/12/2017 15:04	09/12/2017 15:04
	146007-1-BLK	BLK	146007-1-BLK	1061	W	146007	146007	--------	09/12/2017 15:04	09/12/2017 15:04
	SAPS #1 INFLOW D	MD	17091102-001 D	1061	W	146007	146007	09/11/2017	09/12/2017 15:04	09/12/2017 15:04
	F.O. Holding Tnk. Bsn. D	MD	17091205-002 D	1061	W	146007	146007	09/12/2017	09/12/2017 15:04	09/12/2017 15:04
SM 5210B -2011	Effluent VSP-4	Initial	17091107-001	4005	W	146130	146130	09/11/2017	09/12/2017 11:15	09/12/2017 11:15

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091107

WSP USA - Herndon
Kop Flex

Analytical Method: EPA 624 Prep Method: E624PREP
Seq Number: 146065 Matrix: Waste Water Date Prep: 09/11/2017
PSS Sample ID: 17091107-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	100		87-114	%	09/11/17 20:29
4-Bromofluorobenzene	100		90-114	%	09/11/17 20:29
Toluene-D8	101		93-108	%	09/11/17 20:29

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091107

WSP USA - Herndon
Kop Flex

Analytical Method: SM 2540D -2011
Seq Number: 146007 Matrix: Water
MB Sample Id: 146007-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Suspended Solids	ND	0.5000	1.000	mg/L	09/12/17 15:04	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 146052 Matrix: Water Date Prep: 09/13/17
MB Sample Id: 67760-1-BLK LCS Sample Id: 67760-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Calcium	<100	400	421.6	105	85-115	ug/L	09/13/17 14:23	
Copper	<1.000	40.00	42.19	105	85-115	ug/L	09/13/17 14:23	
Lead	<1.000	40.00	41.51	104	85-115	ug/L	09/13/17 14:23	
Magnesium	<100	400	412.3	103	85-115	ug/L	09/13/17 14:23	
Nickel	<1.000	40.00	40.37	101	85-115	ug/L	09/13/17 14:23	
Zinc	<20.00	200	210.9	105	85-115	ug/L	09/13/17 14:23	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 146101 Matrix: Water Date Prep: 09/14/17
MB Sample Id: 67789-1-BLK LCS Sample Id: 67789-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Copper	<1.000	40.00	37.53	94	85-115	ug/L	09/14/17 19:31	
Lead	<1.000	40.00	36.98	92	85-115	ug/L	09/14/17 19:31	
Nickel	<1.000	40.00	36.72	92	85-115	ug/L	09/14/17 19:31	
Zinc	<20.00	200	188.9	94	85-115	ug/L	09/14/17 19:31	

Analytical Method: EPA 200.8 Prep Method: E200.8_PREP
Seq Number: 146101 Matrix: Waste Water Date Prep: 09/14/17
Parent Sample Id: 17091107-001 MS Sample Id: 17091107-001 S MSD Sample Id: 17091107-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Copper	2.740	40.00	40.10	93	41.01	96	70-130	2	25	ug/L	09/14/17 19:44	
Lead	<1.000	40.00	38.21	96	38.52	96	70-130	1	25	ug/L	09/14/17 19:44	
Nickel	9.680	40.00	46.30	92	47.21	94	70-130	2	25	ug/L	09/14/17 19:44	
Zinc	<20.00	200	202.4	101	206.5	103	70-130	2	25	ug/L	09/14/17 19:44	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091107

WSP USA - Herndon
Kop Flex

Analytical Method: EPA 624 Prep Method: E624PREP

Seq Number: 146065 Matrix: Water Date Prep: 09/11/17

MB Sample Id: 67782-1-BLK LCS Sample Id: 67782-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Dichlorodifluoromethane	<5.000	60.00	39.69	66	51-139	ug/L	09/11/17 14:13	
Chloromethane	<5.000	60.00	47.68	79	56-144	ug/L	09/11/17 14:13	
Vinyl Chloride	<5.000	60.00	55.04	92	46-157	ug/L	09/11/17 14:13	
Bromomethane	<5.000	60.00	52.91	88	63-134	ug/L	09/11/17 14:13	
Chloroethane	<5.000	60.00	53.90	90	56-143	ug/L	09/11/17 14:13	
Trichlorofluoromethane	<5.000	60.00	51.32	86	56-138	ug/L	09/11/17 14:13	
1,1-Dichloroethene	<5.000	60.00	55.46	92	63-134	ug/L	09/11/17 14:13	
Methylene Chloride	<5.000	60.00	55.14	92	65-126	ug/L	09/11/17 14:13	
trans-1,2-dichloroethene	<5.000	60.00	54.50	91	67-129	ug/L	09/11/17 14:13	
1,1-Dichloroethane	<5.000	60.00	54.74	91	66-131	ug/L	09/11/17 14:13	
Chloroform	<5.000	60.00	54.19	90	69-130	ug/L	09/11/17 14:13	
1,1,1-Trichloroethane	<5.000	60.00	53.99	90	66-129	ug/L	09/11/17 14:13	
Carbon Tetrachloride	<5.000	60.00	52.51	88	70-133	ug/L	09/11/17 14:13	
Benzene	<5.000	60.00	55.14	92	69-127	ug/L	09/11/17 14:13	
1,2-Dichloroethane	<5.000	60.00	52.82	88	62-133	ug/L	09/11/17 14:13	
Trichloroethene	<5.000	60.00	53.78	90	71-127	ug/L	09/11/17 14:13	
1,2-Dichloropropane	<5.000	60.00	57.60	96	67-133	ug/L	09/11/17 14:13	
Bromodichloromethane	<5.000	60.00	54.30	91	63-132	ug/L	09/11/17 14:13	
2-Chloroethyl Vinyl Ether	<5.000	60.00	71.27	119	21-140	ug/L	09/11/17 14:13	
cis-1,3-Dichloropropene	<5.000	60.00	57.60	96	65-128	ug/L	09/11/17 14:13	
Toluene	<5.000	60.00	56.35	94	67-130	ug/L	09/11/17 14:13	
trans-1,3-dichloropropene	<5.000	60.00	57.81	96	63-127	ug/L	09/11/17 14:13	
1,1,2-Trichloroethane	<5.000	60.00	56.55	94	62-136	ug/L	09/11/17 14:13	
Tetrachloroethylene	<5.000	60.00	54.65	91	64-135	ug/L	09/11/17 14:13	
Dibromochloromethane	<5.000	60.00	56.23	94	65-126	ug/L	09/11/17 14:13	
Chlorobenzene	<5.000	60.00	55.03	92	70-127	ug/L	09/11/17 14:13	
Ethylbenzene	<5.000	60.00	56.34	94	71-131	ug/L	09/11/17 14:13	
Bromoform	<5.000	60.00	55.51	93	58-128	ug/L	09/11/17 14:13	
1,1,2,2-Tetrachloroethane	<5.000	60.00	57.65	96	63-134	ug/L	09/11/17 14:13	
1,3-Dichlorobenzene	<5.000	60.00	54.78	91	67-128	ug/L	09/11/17 14:13	
1,4-Dichlorobenzene	<5.000	60.00	55.88	93	67-127	ug/L	09/11/17 14:13	
1,2-Dichlorobenzene	<5.000	60.00	54.34	91	67-126	ug/L	09/11/17 14:13	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	98		97		87-114	%	09/11/17 14:13
4-Bromofluorobenzene	102		101		90-114	%	09/11/17 14:13
Toluene-D8	101		102		93-108	%	09/11/17 14:13

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

NPDES monthly

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com

email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA

*PROJECT MGR: Eric Johnson PHONE NO.: (703) 705-6500

EMAIL: eric.johnsen@wsp.com FAX NO.: ( )

*PROJECT NAME: Lcp Flex PROJECT NO.:

SITE LOCATION: Hanover MD P.O. NO.: 31400340-9

SAMPLER(S): Marca Kaplan, Shannon Burke DW CERT NO.:

PSS Work Order #: 1709110 7 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * VOCs (624)	BOD 5	TSS	Total metals (Ag, Cu, Ni, Pb, Zn, Cu, Mg, Mn)	Dissolved metals (Fe, Cu, Mn, Pb, Zn, Cu, Mg, Mn)	Hardness (CaCO3)	REMARKS
1	Effluent VSP-4	9/11/17	0855	WW	3	G	HCl	X						
BOD 1	Effluent VSP-4	9/11/17	0855	WW	1	G			X					
B 1	Effluent VSP-4	9/11/17	0855	WW	1	G				X				
H 1	Effluent VSP-4	9/11/17	0855	WW	1	G	HNO3				X		X	Lab to filter
S 1	Effluent VSP-4	9/11/17	0855	WW	1	G	H2SO4					X		

(5)

Relinquished By:	Date	Time	Received By:
(1)	9/11/17	1123	Marca 2345
(2) Marca 2345	09/11/17	11:55	
(3)			
(4)			

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER

# of Coolers: 1 (temp blank 9°C)

Custody Seal: Cooler-Intact

Ice Present: Yes Temp: 10-11°C

Shipping Carrier: TTE

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17091107	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	09/11/2017 11:55:00 AM
Project Name	Kop Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	10/16/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	11
Seal(s) Signed / Dated?	N/A	Temp Blank Present	Yes

Documentation

		Sampler Name	M. Kaplan/S. Burke
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1 Total No. of Containers Received 7

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	No
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		No
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Sample container for BOD not received at Phase, sent directly to sublab 9/11/17.
Sample aliquots for dissolved metals were not field filtered and were received unpreserved.
Acrolein and acrylonitrile not required for EPA 624 samples.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 09/11/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 09/12/2017

Amber Confer

Analytical Report for

WSP USA - Herndon

Certificate of Analysis No.: 17091108

Project Manager: Eric Johnson

Project Name : Kop Flex

Project Location: Hanover, MD

Project ID : 31400390-09

September 19, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

September 19, 2017

Eric Johnson
WSP USA - Herndon
13530 Dulles Technology Dr, Ste 300
Herndon, VA 20171

Reference: PSS Work Order(s) No: **17091108**
Project Name: Kop Flex
Project Location: Hanover, MD
Project ID.: 31400390-09

Dear Eric Johnson :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17091108**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on October 16, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP USA - Herndon

Project Name: Kop Flex

Work Order Number(s): 17091108

Project ID: 31400390-09

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/11/2017 at 11:55 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17091108-001	Effluent VSP-4	WASTE WATER	09/11/17 08:55
17091108-002	Influent VSP-1	WASTE WATER	09/11/17 09:25
17091108-003	TB-091117	WATER	09/11/17 11:55

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091108

WSP USA - Herndon, Herndon, VA

September 19, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Effluent VSP-4 **Date/Time Sampled: 09/11/2017 08:55** **PSS Sample ID: 17091108-001**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	**1.2**	ug/L	1.0		1	09/18/17	09/18/17 15:48	1045

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CERTIFICATE OF ANALYSIS

No: 17091108

WSP USA - Herndon, Herndon, VA

September 19, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Influent VSP-1 **Date/Time Sampled: 09/11/2017 09:25** **PSS Sample ID: 17091108-002**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
Benzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Bromochloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Bromodichloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Bromoform	ND	ug/L	5.0		1	09/14/17	09/14/17 18:04	1045
Bromomethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
2-Butanone (MEK)	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
Carbon Disulfide	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
Carbon Tetrachloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Chlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Chloroethane	**1.7**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Chloroform	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Chloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Cyclohexane	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	09/14/17	09/14/17 18:04	1045
Dibromochloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,3-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,4-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Dichlorodifluoromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,1-Dichloroethane	**40**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2-Dichloroethane	**1.7**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,1-Dichloroethene	**240**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2-Dichloropropane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Ethylbenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091108

WSP USA - Herndon, Herndon, VA

September 19, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: Influent VSP-1 **Date/Time Sampled: 09/11/2017 09:25** **PSS Sample ID: 17091108-002**
Matrix: WASTE WATER **Date/Time Received: 09/11/2017 11:55**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	09/14/17	09/14/17 18:04	1045
Isopropylbenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Methyl Acetate	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
Methylcyclohexane	ND	ug/L	10		1	09/14/17	09/14/17 18:04	1045
Methylene Chloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	09/14/17	09/14/17 18:04	1045
Methyl-t-butyl ether	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Naphthalene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Styrene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Tetrachloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Toluene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,1,1-Trichloroethane	**35**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Trichloroethene	**1.7**	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
1,1,2-Trichloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Trichlorofluoromethane	ND	ug/L	5.0		1	09/14/17	09/14/17 18:04	1045
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
Vinyl Chloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045
m,p-Xylenes	ND	ug/L	2.0		1	09/14/17	09/14/17 18:04	1045
o-Xylene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:04	1045

1,4-Dioxane by GC/MS - SIM — Analytical Method: SW-846 8260 B-Modified — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
1,4-Dioxane (P-Dioxane)	**160**	ug/L	10		10	09/18/17	09/18/17 17:05	1045

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CERTIFICATE OF ANALYSIS

No: 17091108

WSP USA - Herndon, Herndon, VA

September 19, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: TB-091117 **Date/Time Sampled: 09/11/2017 11:55** **PSS Sample ID: 17091108-003**
Matrix: WATER **Date/Time Received: 09/11/2017 11:55**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
Benzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Bromochloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Bromodichloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Bromoform	ND	ug/L	5.0		1	09/14/17	09/14/17 18:29	1045
Bromomethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
2-Butanone (MEK)	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
Carbon Disulfide	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
Carbon Tetrachloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Chlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Chloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Chloroform	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Chloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Cyclohexane	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	09/14/17	09/14/17 18:29	1045
Dibromochloromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,3-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Dichlorodifluoromethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,4-Dichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,1-Dichloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2-Dichloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,1-Dichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
cis-1,2-Dichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2-Dichloropropane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Ethylbenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045

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CERTIFICATE OF ANALYSIS

No: 17091108

WSP USA - Herndon, Herndon, VA

September 19, 2017

Project Name: Kop Flex
Project Location: Hanover, MD
Project ID: 31400390-09

Sample ID: TB-091117 **Date/Time Sampled: 09/11/2017 11:55** **PSS Sample ID: 17091108-003**
Matrix: WATER **Date/Time Received: 09/11/2017 11:55**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	09/14/17	09/14/17 18:29	1045
Isopropylbenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Methyl Acetate	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
Methylcyclohexane	ND	ug/L	10		1	09/14/17	09/14/17 18:29	1045
Methylene Chloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	09/14/17	09/14/17 18:29	1045
Methyl-t-butyl ether	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Naphthalene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Styrene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Tetrachloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Toluene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,1,1-Trichloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Trichloroethene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
1,1,2-Trichloroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Trichlorofluoromethane	ND	ug/L	5.0		1	09/14/17	09/14/17 18:29	1045
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
Vinyl Chloride	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045
m,p-Xylenes	ND	ug/L	2.0		1	09/14/17	09/14/17 18:29	1045
o-Xylene	ND	ug/L	1.0		1	09/14/17	09/14/17 18:29	1045

Case Narrative Summary

Client Name: WSP USA - Herndon

Project Name: Kop Flex

Work Order Number(s): 17091108

Project ID: 31400390-09

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SW-846 8260 B-Modified: 1,4-Dioxane

Analytical Data Package Information Summary

Work Order(s): 17091108
Report Prepared For: WSP USA - Herndon, Herndon, VA
Project Name: Kop Flex
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	Influent VSP-1	Initial	17091108-002	1045	W	67809	146107	09/11/2017	09/14/2017 11:00	09/14/2017 18:04
	TB-091117	Initial	17091108-003	1045	W	67809	146107	09/11/2017	09/14/2017 11:00	09/14/2017 18:29
	67809-1-BKS	BKS	67809-1-BKS	1045	W	67809	146107	--------	09/14/2017 11:00	09/14/2017 11:44
	67809-1-BLK	BLK	67809-1-BLK	1045	W	67809	146107	--------	09/14/2017 11:00	09/14/2017 14:37
	Corrado Dewater 9/7 S	MS	17090809-001 S	1045	W	67809	146107	09/07/2017	09/14/2017 11:00	09/14/2017 15:22
	Corrado Dewater 9/7 SD	MSD	17090809-001 SD	1045	W	67809	146107	09/07/2017	09/14/2017 11:00	09/14/2017 15:45
SW-846 8260 B-Modified	Effluent VSP-4	Initial	17091108-001	1045	W	67830	146159	09/11/2017	09/18/2017 15:58	09/18/2017 15:48
	67830-1-BKS	BKS	67830-1-BKS	1045	W	67830	146159	--------	09/18/2017 15:58	09/18/2017 14:13
	67830-1-BLK	BLK	67830-1-BLK	1045	W	67830	146159	--------	09/18/2017 15:58	09/18/2017 15:24
	67830-1-BSD	BSD	67830-1-BSD	1045	W	67830	146159	--------	09/18/2017 15:58	09/18/2017 14:35
	Influent VSP-1	Reanalysis	17091108-002	1045	W	67830	146159	09/11/2017	09/18/2017 15:58	09/18/2017 17:05

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091108

WSP USA - Herndon
Kop Flex

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 146159 Matrix: Waste Water Date Prep: 09/18/2017
PSS Sample ID: 17091108-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	97		80-120	%	09/18/17 15:48

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 146107 Matrix: Waste Water Date Prep: 09/14/2017
PSS Sample ID: 17091108-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	94		86-111	%	09/14/17 18:04
Dibromofluoromethane	105		91-119	%	09/14/17 18:04
Toluene-D8	99		90-117	%	09/14/17 18:04

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 146159 Matrix: Waste Water Date Prep: 09/18/2017
PSS Sample ID: 17091108-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Toluene-D8	93		80-120	%	09/18/17 16:13

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 146107 Matrix: Water Date Prep: 09/14/2017
PSS Sample ID: 17091108-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	94		86-111	%	09/14/17 18:29
Dibromofluoromethane	102		91-119	%	09/14/17 18:29
Toluene-D8	102		90-117	%	09/14/17 18:29

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091108

WSP USA - Herndon

Kop Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 146107 Matrix: Water Date Prep: 09/14/17

MB Sample Id: 67809-1-BLK LCS Sample Id: 67809-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	46.81	94	29-149	ug/L	09/14/17 11:44	
Benzene	<1.000	50.00	48.13	96	85-123	ug/L	09/14/17 11:44	
Bromochloromethane	<1.000	50.00	53.98	108	82-136	ug/L	09/14/17 11:44	
Bromodichloromethane	<1.000	50.00	48.61	97	88-133	ug/L	09/14/17 11:44	
Bromoform	<5.000	50.00	50.37	101	80-126	ug/L	09/14/17 11:44	
Bromomethane	<1.000	50.00	43.45	87	64-139	ug/L	09/14/17 11:44	
2-Butanone (MEK)	<10.00	50.00	51.24	102	39-135	ug/L	09/14/17 11:44	
Carbon Disulfide	<10.00	50.00	41.59	83	85-124	ug/L	09/14/17 11:44	L
Carbon Tetrachloride	<1.000	50.00	46.81	94	81-138	ug/L	09/14/17 11:44	
Chlorobenzene	<1.000	50.00	48.04	96	85-120	ug/L	09/14/17 11:44	
Chloroethane	<1.000	50.00	37.81	76	75-129	ug/L	09/14/17 11:44	
Chloroform	<1.000	50.00	45.49	91	85-128	ug/L	09/14/17 11:44	
Chloromethane	<1.000	50.00	39.32	79	60-139	ug/L	09/14/17 11:44	
Cyclohexane	<10.00	50.00	45.79	92	55-131	ug/L	09/14/17 11:44	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	49.52	99	69-127	ug/L	09/14/17 11:44	
Dibromochloromethane	<1.000	50.00	50.91	102	82-127	ug/L	09/14/17 11:44	
1,2-Dibromoethane (EDB)	<1.000	50.00	48.64	97	82-121	ug/L	09/14/17 11:44	
1,2-Dichlorobenzene	<1.000	50.00	50.28	101	82-123	ug/L	09/14/17 11:44	
1,3-Dichlorobenzene	<1.000	50.00	50.24	100	81-123	ug/L	09/14/17 11:44	
1,4-Dichlorobenzene	<1.000	50.00	50.15	100	81-121	ug/L	09/14/17 11:44	
Dichlorodifluoromethane	<1.000	50.00	43.70	87	69-147	ug/L	09/14/17 11:44	
1,1-Dichloroethane	<1.000	50.00	44.43	89	83-123	ug/L	09/14/17 11:44	
1,2-Dichloroethane	<1.000	50.00	45.98	92	86-138	ug/L	09/14/17 11:44	
1,1-Dichloroethene	<1.000	50.00	47.91	96	85-127	ug/L	09/14/17 11:44	
cis-1,2-Dichloroethene	<1.000	50.00	49.54	99	87-127	ug/L	09/14/17 11:44	
1,2-Dichloropropane	<1.000	50.00	47.52	95	79-125	ug/L	09/14/17 11:44	
cis-1,3-Dichloropropene	<1.000	50.00	48.57	97	79-131	ug/L	09/14/17 11:44	
trans-1,3-Dichloropropene	<1.000	50.00	50.68	101	82-133	ug/L	09/14/17 11:44	
trans-1,2-Dichloroethene	<1.000	50.00	47.98	96	85-125	ug/L	09/14/17 11:44	
Ethylbenzene	<1.000	50.00	48.71	97	83-123	ug/L	09/14/17 11:44	
2-Hexanone	<5.000	50.00	52.07	104	37-137	ug/L	09/14/17 11:44	
Isopropylbenzene	<1.000	50.00	49.02	98	70-131	ug/L	09/14/17 11:44	
Methyl Acetate	<10.00	50.00	40.80	82	69-127	ug/L	09/14/17 11:44	
Methylcyclohexane	<10.00	50.00	50.34	101	75-129	ug/L	09/14/17 11:44	
Methylene Chloride	<1.000	50.00	47.33	95	86-124	ug/L	09/14/17 11:44	
4-Methyl-2-Pentanone	<5.000	50.00	48.94	98	39-143	ug/L	09/14/17 11:44	
Methyl-t-butyl ether	<1.000	50.00	48.12	96	75-134	ug/L	09/14/17 11:44	
Naphthalene	<1.000	50.00	54.76	110	61-118	ug/L	09/14/17 11:44	
Styrene	<1.000	50.00	51.43	103	80-120	ug/L	09/14/17 11:44	
1,1,2,2-Tetrachloroethane	<1.000	50.00	46.19	92	64-125	ug/L	09/14/17 11:44	
Tetrachloroethene	<1.000	50.00	53.84	108	83-138	ug/L	09/14/17 11:44	
Toluene	<1.000	50.00	49.58	99	88-126	ug/L	09/14/17 11:44	
1,2,3-Trichlorobenzene	<1.000	50.00	52.58	105	75-124	ug/L	09/14/17 11:44	
1,2,4-Trichlorobenzene	<1.000	50.00	50.19	100	77-131	ug/L	09/14/17 11:44	
1,1,1-Trichloroethane	<1.000	50.00	50.08	100	68-146	ug/L	09/14/17 11:44	
1,1,2-Trichloroethane	<1.000	50.00	48.65	97	85-124	ug/L	09/14/17 11:44	
Trichloroethene	<1.000	50.00	50.42	101	87-127	ug/L	09/14/17 11:44	
Trichlorofluoromethane	<5.000	50.00	47.95	96	77-147	ug/L	09/14/17 11:44	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	48.91	98	68-135	ug/L	09/14/17 11:44	
Vinyl Chloride	<1.000	50.00	45.22	90	74-138	ug/L	09/14/17 11:44	
m,p-Xylenes	<2.000	100	99.53	100	84-124	ug/L	09/14/17 11:44	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091108

WSP USA - Herndon
Kop Flex

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 146107 Matrix: Water Date Prep: 09/14/17
MB Sample Id: 67809-1-BLK LCS Sample Id: 67809-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	50.35	101	79-126	ug/L	09/14/17 11:44	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		95		86-111	%	09/14/17 11:44
Dibromofluoromethane	102		101		91-119	%	09/14/17 11:44
Toluene-D8	103		100		90-117	%	09/14/17 11:44

Analytical Method: SW-846 8260 B-Modified Prep Method: SW5030B
Seq Number: 146159 Matrix: Water Date Prep: 09/18/17
MB Sample Id: 67830-1-BLK LCS Sample Id: 67830-1-BKS LCSD Sample Id: 67830-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
1,4-Dioxane (P-Dioxane)	<1.000	30.00	29.13	97	32.37	108	50-150	11	20	ug/L	09/18/17 14:13	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Toluene-D8	95		98		99		80-120	%	09/18/17 14:13

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

Internal Sampling

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: WSP *OFFICE LOC. Herndon VA
*PROJECT MGR: Eric Johnson *PHONE NO.: (703 705 - 6500
EMAIL: eric.johnson@wsp.com FAX NO.: ( )
*PROJECT NAME: Raptflex PROJECT NO.: 31400390 09
SITE LOCATION: Hanover, MD P.O. NO.:
SAMPLER(S): Morrison Kaplan, Shannon Burke DW CERT NO.:

PSS Work Order #: 1709108 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/ Method Required (3) * 1,4 Dioxane (8260 SIM)	VOCs (8260)	REMARKS
	Effluent VSP-4	9/11/17	0855	WW	3	G		X		
	Influent VSP-1	9/11/17	0925	WW	6	G		X	X	Influent VSP-1
	TB-091117	—	—	—	2	—			X	

(5)

Relinquished By:	Date	Time	Received By:
(1)	9/11/17	1423	Marni 234
(2) Marc 2345	09/11/17	11:55	
(3)			
(4)			

(4)

*Requested TAT (One TAT per COC)
☒ 5-Day ☐ 3-Day ☐ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA QC SUMM CLP LIKE OTHER ☐ ☐ ☐ _____

# of Coolers: 1 (temp blank 9°C)
Custody Seal: Cooler-Intact
Ice Present: Pres Temp: 10-11°C
Shipping Carrier: TTE

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE _____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER _____

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17091108	**Received By**	Thomas Wingate
Client Name	WSP USA - Herndon	**Date Received**	09/11/2017 11:55:00 AM
Project Name	Kop Flex	**Delivered By**	Trans Time Express
Project Number	31400390-09	**Tracking No**	Not Applicable
Disposal Date	10/16/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	11
Seal(s) Signed / Dated?	Yes	Temp Blank Present	Yes

Documentation

		Sampler Name	M. Kaplan/S. Burke
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 3 Total No. of Containers Received 11

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 09/11/2017

Thomas Wingate

PM Review and Approval: Amber J Confer Date: 09/12/2017

Amber Confer

ENCLOSURE B – CERTIFIED LABORATORY REPORTS FOR SEMI-ANNUAL GROUNDWATER SAMPLES FROM RECOVERY WELLS (AUGUST 2017)

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 11, 2017

Eric Johnson
WSP USA
13530 Dulles Technology Drive
Suite 300
Herndon, VA 20171

RE: Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Dear Eric Johnson:
Enclosed are the analytical results for sample(s) received by the laboratory on September 01, 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.

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

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
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

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92353809001	**RW-1S**	Water	08/31/17 09:55	09/01/17 10:35
92353809002	**RW-2S**	Water	08/31/17 10:13	09/01/17 10:35
92353809003	**RW-3S**	Water	08/31/17 11:20	09/01/17 10:35
92353809004	**RW-1D**	Water	08/31/17 11:35	09/01/17 10:35
92353809005	**RW-2D MS/MSD**	Water	08/31/17 11:40	09/01/17 10:35
92353809006	**RW-20D**	Water	08/31/17 09:00	09/01/17 10:35
92353809007	**TRIP BLANK**	Water	08/31/17 00:00	09/01/17 10:35

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92353809001	**RW-1S**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809002	**RW-2S**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809003	**RW-3S**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809004	**RW-1D**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809005	**RW-2D MS/MSD**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809006	**RW-20D**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C
92353809007	**TRIP BLANK**	EPA 8260	ZDO	63	PASI-C
		EPA 8260B Mod.	DLK	3	PASI-C

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-1S **Lab ID: 92353809001** Collected: 08/31/17 09:55 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	4		09/07/17 17:58	67-64-1	
Benzene	ND	ug/L	4.0	4		09/07/17 17:58	71-43-2	
Bromobenzene	ND	ug/L	4.0	4		09/07/17 17:58	108-86-1	
Bromochloromethane	ND	ug/L	4.0	4		09/07/17 17:58	74-97-5	
Bromodichloromethane	ND	ug/L	4.0	4		09/07/17 17:58	75-27-4	
Bromoform	ND	ug/L	4.0	4		09/07/17 17:58	75-25-2	
Bromomethane	ND	ug/L	8.0	4		09/07/17 17:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	4		09/07/17 17:58	78-93-3	
Carbon tetrachloride	ND	ug/L	4.0	4		09/07/17 17:58	56-23-5	
Chlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	108-90-7	
Chloroethane	**19.8**	ug/L	4.0	4		09/07/17 17:58	75-00-3	
Chloroform	ND	ug/L	4.0	4		09/07/17 17:58	67-66-3	
Chloromethane	ND	ug/L	4.0	4		09/07/17 17:58	74-87-3	
2-Chlorotoluene	ND	ug/L	4.0	4		09/07/17 17:58	95-49-8	
4-Chlorotoluene	ND	ug/L	4.0	4		09/07/17 17:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	8.0	4		09/07/17 17:58	96-12-8	
Dibromochloromethane	ND	ug/L	4.0	4		09/07/17 17:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	4.0	4		09/07/17 17:58	106-93-4	
Dibromomethane	ND	ug/L	4.0	4		09/07/17 17:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	4		09/07/17 17:58	75-71-8	
1,1-Dichloroethane	**192**	ug/L	4.0	4		09/07/17 17:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	4.0	4		09/07/17 17:58	107-06-2	
1,1-Dichloroethene	**434**	ug/L	4.0	4		09/07/17 17:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	4.0	4		09/07/17 17:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	4.0	4		09/07/17 17:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	4.0	4		09/07/17 17:58	78-87-5	
1,3-Dichloropropane	ND	ug/L	4.0	4		09/07/17 17:58	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	4		09/07/17 17:58	594-20-7	
1,1-Dichloropropene	ND	ug/L	4.0	4		09/07/17 17:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	4		09/07/17 17:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	4		09/07/17 17:58	10061-02-6	
Diisopropyl ether	ND	ug/L	4.0	4		09/07/17 17:58	108-20-3	
Ethylbenzene	ND	ug/L	4.0	4		09/07/17 17:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	4.0	4		09/07/17 17:58	87-68-3	
2-Hexanone	ND	ug/L	20.0	4		09/07/17 17:58	591-78-6	
p-Isopropyltoluene	ND	ug/L	4.0	4		09/07/17 17:58	99-87-6	
Methylene Chloride	ND	ug/L	8.0	4		09/07/17 17:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	4		09/07/17 17:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	4		09/07/17 17:58	1634-04-4	
Naphthalene	ND	ug/L	4.0	4		09/07/17 17:58	91-20-3	
Styrene	ND	ug/L	4.0	4		09/07/17 17:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	4.0	4		09/07/17 17:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	4.0	4		09/07/17 17:58	79-34-5	
Tetrachloroethene	ND	ug/L	4.0	4		09/07/17 17:58	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-1S **Lab ID: 92353809001** Collected: 08/31/17 09:55 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	4.0	4		09/07/17 17:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	4.0	4		09/07/17 17:58	120-82-1	
1,1,1-Trichloroethane	**18.4**	ug/L	4.0	4		09/07/17 17:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	4.0	4		09/07/17 17:58	79-00-5	
Trichloroethene	ND	ug/L	4.0	4		09/07/17 17:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	4		09/07/17 17:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	4		09/07/17 17:58	96-18-4	
Vinyl acetate	ND	ug/L	8.0	4		09/07/17 17:58	108-05-4	
Vinyl chloride	ND	ug/L	4.0	4		09/07/17 17:58	75-01-4	
Xylene (Total)	ND	ug/L	4.0	4		09/07/17 17:58	1330-20-7	
m&p-Xylene	ND	ug/L	8.0	4		09/07/17 17:58	179601-23-1	
o-Xylene	ND	ug/L	4.0	4		09/07/17 17:58	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	4		09/07/17 17:58	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	4		09/07/17 17:58	17060-07-0	
Toluene-d8 (S)	107	%	70-130	4		09/07/17 17:58	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**586**	ug/L	40.0	20		09/07/17 16:39	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%	50-150	20		09/07/17 16:39	17060-07-0	
Toluene-d8 (S)	116	%	50-150	20		09/07/17 16:39	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-2S **Lab ID: 92353809002** Collected: 08/31/17 10:13 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	100	4		09/07/17 19:07	67-64-1	
Benzene	ND	ug/L	4.0	4		09/07/17 19:07	71-43-2	
Bromobenzene	ND	ug/L	4.0	4		09/07/17 19:07	108-86-1	
Bromochloromethane	ND	ug/L	4.0	4		09/07/17 19:07	74-97-5	
Bromodichloromethane	ND	ug/L	4.0	4		09/07/17 19:07	75-27-4	
Bromoform	ND	ug/L	4.0	4		09/07/17 19:07	75-25-2	
Bromomethane	ND	ug/L	8.0	4		09/07/17 19:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	4		09/07/17 19:07	78-93-3	
Carbon tetrachloride	ND	ug/L	4.0	4		09/07/17 19:07	56-23-5	
Chlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	108-90-7	
Chloroethane	ND	ug/L	4.0	4		09/07/17 19:07	75-00-3	
Chloroform	ND	ug/L	4.0	4		09/07/17 19:07	67-66-3	
Chloromethane	ND	ug/L	4.0	4		09/07/17 19:07	74-87-3	
2-Chlorotoluene	ND	ug/L	4.0	4		09/07/17 19:07	95-49-8	
4-Chlorotoluene	ND	ug/L	4.0	4		09/07/17 19:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	8.0	4		09/07/17 19:07	96-12-8	
Dibromochloromethane	ND	ug/L	4.0	4		09/07/17 19:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	4.0	4		09/07/17 19:07	106-93-4	
Dibromomethane	ND	ug/L	4.0	4		09/07/17 19:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	4		09/07/17 19:07	75-71-8	
1,1-Dichloroethane	**71.7**	ug/L	4.0	4		09/07/17 19:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	4.0	4		09/07/17 19:07	107-06-2	
1,1-Dichloroethene	**390**	ug/L	4.0	4		09/07/17 19:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	4.0	4		09/07/17 19:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	4.0	4		09/07/17 19:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	4.0	4		09/07/17 19:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	4.0	4		09/07/17 19:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	4		09/07/17 19:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	4.0	4		09/07/17 19:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	4		09/07/17 19:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	4		09/07/17 19:07	10061-02-6	
Diisopropyl ether	ND	ug/L	4.0	4		09/07/17 19:07	108-20-3	
Ethylbenzene	ND	ug/L	4.0	4		09/07/17 19:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	4.0	4		09/07/17 19:07	87-68-3	
2-Hexanone	ND	ug/L	20.0	4		09/07/17 19:07	591-78-6	
p-Isopropyltoluene	ND	ug/L	4.0	4		09/07/17 19:07	99-87-6	
Methylene Chloride	ND	ug/L	8.0	4		09/07/17 19:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	4		09/07/17 19:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	4		09/07/17 19:07	1634-04-4	
Naphthalene	ND	ug/L	4.0	4		09/07/17 19:07	91-20-3	
Styrene	ND	ug/L	4.0	4		09/07/17 19:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	4.0	4		09/07/17 19:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	4.0	4		09/07/17 19:07	79-34-5	
Tetrachloroethene	ND	ug/L	4.0	4		09/07/17 19:07	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-2S **Lab ID: 92353809002** Collected: 08/31/17 10:13 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	4.0	4		09/07/17 19:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	4.0	4		09/07/17 19:07	120-82-1	
1,1,1-Trichloroethane	**491**	ug/L	4.0	4		09/07/17 19:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	4.0	4		09/07/17 19:07	79-00-5	
Trichloroethene	ND	ug/L	4.0	4		09/07/17 19:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	4		09/07/17 19:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	4		09/07/17 19:07	96-18-4	
Vinyl acetate	ND	ug/L	8.0	4		09/07/17 19:07	108-05-4	
Vinyl chloride	ND	ug/L	4.0	4		09/07/17 19:07	75-01-4	
Xylene (Total)	ND	ug/L	4.0	4		09/07/17 19:07	1330-20-7	
m&p-Xylene	ND	ug/L	8.0	4		09/07/17 19:07	179601-23-1	
o-Xylene	ND	ug/L	4.0	4		09/07/17 19:07	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	4		09/07/17 19:07	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	4		09/07/17 19:07	17060-07-0	
Toluene-d8 (S)	107	%	70-130	4		09/07/17 19:07	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**482**	ug/L	20.0	10		09/07/17 16:58	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	115	%	50-150	10		09/07/17 16:58	17060-07-0	
Toluene-d8 (S)	117	%	50-150	10		09/07/17 16:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-3S **Lab ID: 92353809003** Collected: 08/31/17 11:20 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		09/06/17 06:08	67-64-1	
Benzene	ND	ug/L	1.0	1		09/06/17 06:08	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/06/17 06:08	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/06/17 06:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/06/17 06:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		09/06/17 06:08	75-25-2	
Bromomethane	ND	ug/L	2.0	1		09/06/17 06:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		09/06/17 06:08	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		09/06/17 06:08	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		09/06/17 06:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		09/06/17 06:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		09/06/17 06:08	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 06:08	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 06:08	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		09/06/17 06:08	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		09/06/17 06:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/06/17 06:08	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		09/06/17 06:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/06/17 06:08	75-71-8	
1,1-Dichloroethane	**1.1**	ug/L	1.0	1		09/06/17 06:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/06/17 06:08	107-06-2	
1,1-Dichloroethene	**1.7**	ug/L	1.0	1		09/06/17 06:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 06:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 06:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:08	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:08	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:08	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:08	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		09/06/17 06:08	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		09/06/17 06:08	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/06/17 06:08	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		09/06/17 06:08	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		09/06/17 06:08	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		09/06/17 06:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/06/17 06:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/06/17 06:08	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		09/06/17 06:08	91-20-3	
Styrene	ND	ug/L	1.0	1		09/06/17 06:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 06:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 06:08	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/06/17 06:08	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-3S **Lab ID: 92353809003** Collected: 08/31/17 11:20 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	1.0	1		09/06/17 06:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:08	120-82-1	
1,1,1-Trichloroethane	**4.2**	ug/L	1.0	1		09/06/17 06:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/06/17 06:08	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		09/06/17 06:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		09/06/17 06:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		09/06/17 06:08	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		09/06/17 06:08	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		09/06/17 06:08	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		09/06/17 06:08	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		09/06/17 06:08	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		09/06/17 06:08	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		09/06/17 06:08	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		09/06/17 06:08	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		09/06/17 06:08	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**5.9**	ug/L	2.0	1		09/07/17 17:16	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	113	%	50-150	1		09/07/17 17:16	17060-07-0	
Toluene-d8 (S)	116	%	50-150	1		09/07/17 17:16	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-1D **Lab ID: 92353809004** Collected: 08/31/17 11:35 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		09/06/17 06:25	67-64-1	
Benzene	ND	ug/L	1.0	1		09/06/17 06:25	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/06/17 06:25	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/06/17 06:25	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/06/17 06:25	75-27-4	
Bromoform	ND	ug/L	1.0	1		09/06/17 06:25	75-25-2	
Bromomethane	ND	ug/L	2.0	1		09/06/17 06:25	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		09/06/17 06:25	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		09/06/17 06:25	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	108-90-7	
Chloroethane	ND	ug/L	1.0	1		09/06/17 06:25	75-00-3	
Chloroform	ND	ug/L	1.0	1		09/06/17 06:25	67-66-3	
Chloromethane	ND	ug/L	1.0	1		09/06/17 06:25	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 06:25	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 06:25	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		09/06/17 06:25	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		09/06/17 06:25	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/06/17 06:25	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		09/06/17 06:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/06/17 06:25	75-71-8	
1,1-Dichloroethane	**15.7**	ug/L	1.0	1		09/06/17 06:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/06/17 06:25	107-06-2	
1,1-Dichloroethene	**99.7**	ug/L	1.0	1		09/06/17 06:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 06:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 06:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:25	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:25	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 06:25	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:25	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 06:25	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		09/06/17 06:25	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		09/06/17 06:25	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/06/17 06:25	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		09/06/17 06:25	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		09/06/17 06:25	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		09/06/17 06:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/06/17 06:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/06/17 06:25	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		09/06/17 06:25	91-20-3	
Styrene	ND	ug/L	1.0	1		09/06/17 06:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 06:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 06:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/06/17 06:25	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-1D **Lab ID: 92353809004** Collected: 08/31/17 11:35 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	1.0	1		09/06/17 06:25	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 06:25	120-82-1	
1,1,1-Trichloroethane	**1.6**	ug/L	1.0	1		09/06/17 06:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/06/17 06:25	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		09/06/17 06:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		09/06/17 06:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		09/06/17 06:25	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		09/06/17 06:25	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		09/06/17 06:25	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		09/06/17 06:25	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		09/06/17 06:25	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		09/06/17 06:25	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		09/06/17 06:25	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		09/06/17 06:25	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		09/06/17 06:25	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**52.8**	ug/L	2.0	1		09/07/17 17:35	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	50-150	1		09/07/17 17:35	17060-07-0	
Toluene-d8 (S)	114	%	50-150	1		09/07/17 17:35	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-2D MS/MSD **Lab ID: 92353809005** Collected: 08/31/17 11:40 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	50.0	2		09/06/17 07:17	67-64-1	
Benzene	ND	ug/L	2.0	2		09/06/17 07:17	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		09/06/17 07:17	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		09/06/17 07:17	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		09/06/17 07:17	75-27-4	
Bromoform	ND	ug/L	2.0	2		09/06/17 07:17	75-25-2	
Bromomethane	ND	ug/L	4.0	2		09/06/17 07:17	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		09/06/17 07:17	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		09/06/17 07:17	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	108-90-7	
Chloroethane	ND	ug/L	2.0	2		09/06/17 07:17	75-00-3	
Chloroform	ND	ug/L	2.0	2		09/06/17 07:17	67-66-3	
Chloromethane	ND	ug/L	2.0	2		09/06/17 07:17	74-87-3	M1
2-Chlorotoluene	ND	ug/L	2.0	2		09/06/17 07:17	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		09/06/17 07:17	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		09/06/17 07:17	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		09/06/17 07:17	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		09/06/17 07:17	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		09/06/17 07:17	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		09/06/17 07:17	75-71-8	
1,1-Dichloroethane	**42.4**	ug/L	2.0	2		09/06/17 07:17	75-34-3	
1,2-Dichloroethane	**2.7**	ug/L	2.0	2		09/06/17 07:17	107-06-2	
1,1-Dichloroethene	**306**	ug/L	2.0	2		09/06/17 07:17	75-35-4	M1
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		09/06/17 07:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		09/06/17 07:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		09/06/17 07:17	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		09/06/17 07:17	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		09/06/17 07:17	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		09/06/17 07:17	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		09/06/17 07:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		09/06/17 07:17	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		09/06/17 07:17	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		09/06/17 07:17	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		09/06/17 07:17	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		09/06/17 07:17	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		09/06/17 07:17	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		09/06/17 07:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		09/06/17 07:17	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		09/06/17 07:17	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		09/06/17 07:17	91-20-3	
Styrene	ND	ug/L	2.0	2		09/06/17 07:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		09/06/17 07:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		09/06/17 07:17	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		09/06/17 07:17	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-2D MS/MSD **Lab ID: 92353809005** Collected: 08/31/17 11:40 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	2.0	2		09/06/17 07:17	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		09/06/17 07:17	120-82-1	
1,1,1-Trichloroethane	**11.2**	ug/L	2.0	2		09/06/17 07:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		09/06/17 07:17	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		09/06/17 07:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		09/06/17 07:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		09/06/17 07:17	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		09/06/17 07:17	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		09/06/17 07:17	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		09/06/17 07:17	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		09/06/17 07:17	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		09/06/17 07:17	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	2		09/06/17 07:17	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	2		09/06/17 07:17	17060-07-0	
Toluene-d8 (S)	107	%	70-130	2		09/06/17 07:17	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**149**	ug/L	5.0	2.5		09/07/17 17:54	123-91-1	M1
Surrogates								
1,2-Dichloroethane-d4 (S)	112	%	50-150	2.5		09/07/17 17:54	17060-07-0	
Toluene-d8 (S)	113	%	50-150	2.5		09/07/17 17:54	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-20D **Lab ID: 92353809006** Collected: 08/31/17 09:00 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	50.0	2		09/07/17 20:34	67-64-1	
Benzene	ND	ug/L	2.0	2		09/07/17 20:34	71-43-2	
Bromobenzene	ND	ug/L	2.0	2		09/07/17 20:34	108-86-1	
Bromochloromethane	ND	ug/L	2.0	2		09/07/17 20:34	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	2		09/07/17 20:34	75-27-4	
Bromoform	ND	ug/L	2.0	2		09/07/17 20:34	75-25-2	
Bromomethane	ND	ug/L	4.0	2		09/07/17 20:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	10.0	2		09/07/17 20:34	78-93-3	
Carbon tetrachloride	ND	ug/L	2.0	2		09/07/17 20:34	56-23-5	
Chlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	108-90-7	
Chloroethane	ND	ug/L	2.0	2		09/07/17 20:34	75-00-3	
Chloroform	ND	ug/L	2.0	2		09/07/17 20:34	67-66-3	
Chloromethane	ND	ug/L	2.0	2		09/07/17 20:34	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	2		09/07/17 20:34	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	2		09/07/17 20:34	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	2		09/07/17 20:34	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	2		09/07/17 20:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	2		09/07/17 20:34	106-93-4	
Dibromomethane	ND	ug/L	2.0	2		09/07/17 20:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	2		09/07/17 20:34	75-71-8	
1,1-Dichloroethane	**39.8**	ug/L	2.0	2		09/07/17 20:34	75-34-3	
1,2-Dichloroethane	**2.7**	ug/L	2.0	2		09/07/17 20:34	107-06-2	
1,1-Dichloroethene	**278**	ug/L	2.0	2		09/07/17 20:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	2		09/07/17 20:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	2		09/07/17 20:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	2		09/07/17 20:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	2		09/07/17 20:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	2		09/07/17 20:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	2		09/07/17 20:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	2		09/07/17 20:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	2		09/07/17 20:34	10061-02-6	
Diisopropyl ether	ND	ug/L	2.0	2		09/07/17 20:34	108-20-3	
Ethylbenzene	ND	ug/L	2.0	2		09/07/17 20:34	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	2.0	2		09/07/17 20:34	87-68-3	
2-Hexanone	ND	ug/L	10.0	2		09/07/17 20:34	591-78-6	
p-Isopropyltoluene	ND	ug/L	2.0	2		09/07/17 20:34	99-87-6	
Methylene Chloride	ND	ug/L	4.0	2		09/07/17 20:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	10.0	2		09/07/17 20:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	2.0	2		09/07/17 20:34	1634-04-4	
Naphthalene	ND	ug/L	2.0	2		09/07/17 20:34	91-20-3	
Styrene	ND	ug/L	2.0	2		09/07/17 20:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	2		09/07/17 20:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	2		09/07/17 20:34	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	2		09/07/17 20:34	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: RW-20D **Lab ID: 92353809006** Collected: 08/31/17 09:00 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	2.0	2		09/07/17 20:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	2.0	2		09/07/17 20:34	120-82-1	
1,1,1-Trichloroethane	**10.3**	ug/L	2.0	2		09/07/17 20:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	2		09/07/17 20:34	79-00-5	
Trichloroethene	ND	ug/L	2.0	2		09/07/17 20:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	2.0	2		09/07/17 20:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	2		09/07/17 20:34	96-18-4	
Vinyl acetate	ND	ug/L	4.0	2		09/07/17 20:34	108-05-4	
Vinyl chloride	ND	ug/L	2.0	2		09/07/17 20:34	75-01-4	
Xylene (Total)	ND	ug/L	2.0	2		09/07/17 20:34	1330-20-7	
m&p-Xylene	ND	ug/L	4.0	2		09/07/17 20:34	179601-23-1	
o-Xylene	ND	ug/L	2.0	2		09/07/17 20:34	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	2		09/07/17 20:34	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	2		09/07/17 20:34	17060-07-0	
Toluene-d8 (S)	108	%	70-130	2		09/07/17 20:34	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	**136**	ug/L	5.0	2.5		09/08/17 11:38	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%	50-150	1		09/07/17 18:51	17060-07-0	
Toluene-d8 (S)	109	%	50-150	1		09/07/17 18:51	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: TRIP BLANK **Lab ID: 92353809007** Collected: 08/31/17 00:00 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		09/06/17 02:04	67-64-1	
Benzene	ND	ug/L	1.0	1		09/06/17 02:04	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		09/06/17 02:04	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		09/06/17 02:04	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		09/06/17 02:04	75-27-4	
Bromoform	ND	ug/L	1.0	1		09/06/17 02:04	75-25-2	
Bromomethane	ND	ug/L	2.0	1		09/06/17 02:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		09/06/17 02:04	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		09/06/17 02:04	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	108-90-7	
Chloroethane	ND	ug/L	1.0	1		09/06/17 02:04	75-00-3	
Chloroform	ND	ug/L	1.0	1		09/06/17 02:04	67-66-3	
Chloromethane	ND	ug/L	1.0	1		09/06/17 02:04	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 02:04	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		09/06/17 02:04	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	2.0	1		09/06/17 02:04	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		09/06/17 02:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		09/06/17 02:04	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		09/06/17 02:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		09/06/17 02:04	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		09/06/17 02:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		09/06/17 02:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		09/06/17 02:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 02:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		09/06/17 02:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 02:04	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		09/06/17 02:04	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		09/06/17 02:04	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		09/06/17 02:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 02:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		09/06/17 02:04	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	1		09/06/17 02:04	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		09/06/17 02:04	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		09/06/17 02:04	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		09/06/17 02:04	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		09/06/17 02:04	99-87-6	
Methylene Chloride	ND	ug/L	2.0	1		09/06/17 02:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		09/06/17 02:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		09/06/17 02:04	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		09/06/17 02:04	91-20-3	
Styrene	ND	ug/L	1.0	1		09/06/17 02:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 02:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		09/06/17 02:04	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		09/06/17 02:04	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Sample: TRIP BLANK **Lab ID: 92353809007** Collected: 08/31/17 00:00 Received: 09/01/17 10:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260							
Toluene	ND	ug/L	1.0	1		09/06/17 02:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		09/06/17 02:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		09/06/17 02:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		09/06/17 02:04	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		09/06/17 02:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		09/06/17 02:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		09/06/17 02:04	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		09/06/17 02:04	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		09/06/17 02:04	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		09/06/17 02:04	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	1		09/06/17 02:04	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		09/06/17 02:04	95-47-6	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		09/06/17 02:04	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		09/06/17 02:04	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		09/06/17 02:04	2037-26-5	
8260 MSV SIM	Analytical Method: EPA 8260B Mod.							
1,4-Dioxane (p-Dioxane)	ND	ug/L	2.0	1		09/11/17 14:00	123-91-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	50-150	1		09/11/17 14:00	17060-07-0	
Toluene-d8 (S)	106	%	50-150	1		09/11/17 14:00	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

QC Batch: 376382 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92353809007

METHOD BLANK: 2085197 Matrix: Water
Associated Lab Samples: 92353809007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,1-Dichloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,1-Dichloroethene	ug/L	ND	1.0	09/06/17 00:55	
1,1-Dichloropropene	ug/L	ND	1.0	09/06/17 00:55	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
1,2,3-Trichloropropane	ug/L	ND	1.0	09/06/17 00:55	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	09/06/17 00:55	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/06/17 00:55	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
1,2-Dichloroethane	ug/L	ND	1.0	09/06/17 00:55	
1,2-Dichloropropane	ug/L	ND	1.0	09/06/17 00:55	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
1,3-Dichloropropane	ug/L	ND	1.0	09/06/17 00:55	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
2,2-Dichloropropane	ug/L	ND	1.0	09/06/17 00:55	
2-Butanone (MEK)	ug/L	ND	5.0	09/06/17 00:55	
2-Chlorotoluene	ug/L	ND	1.0	09/06/17 00:55	
2-Hexanone	ug/L	ND	5.0	09/06/17 00:55	
4-Chlorotoluene	ug/L	ND	1.0	09/06/17 00:55	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/06/17 00:55	
Acetone	ug/L	ND	25.0	09/06/17 00:55	
Benzene	ug/L	ND	1.0	09/06/17 00:55	
Bromobenzene	ug/L	ND	1.0	09/06/17 00:55	
Bromochloromethane	ug/L	ND	1.0	09/06/17 00:55	
Bromodichloromethane	ug/L	ND	1.0	09/06/17 00:55	
Bromoform	ug/L	ND	1.0	09/06/17 00:55	
Bromomethane	ug/L	ND	2.0	09/06/17 00:55	
Carbon tetrachloride	ug/L	ND	1.0	09/06/17 00:55	
Chlorobenzene	ug/L	ND	1.0	09/06/17 00:55	
Chloroethane	ug/L	ND	1.0	09/06/17 00:55	
Chloroform	ug/L	ND	1.0	09/06/17 00:55	
Chloromethane	ug/L	ND	1.0	09/06/17 00:55	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/06/17 00:55	
cis-1,3-Dichloropropene	ug/L	ND	1.0	09/06/17 00:55	
Dibromochloromethane	ug/L	ND	1.0	09/06/17 00:55	
Dibromomethane	ug/L	ND	1.0	09/06/17 00:55	
Dichlorodifluoromethane	ug/L	ND	1.0	09/06/17 00:55	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

METHOD BLANK: 2085197 Matrix: Water
Associated Lab Samples: 92353809007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	09/06/17 00:55	
Ethylbenzene	ug/L	ND	1.0	09/06/17 00:55	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	09/06/17 00:55	
m&p-Xylene	ug/L	ND	2.0	09/06/17 00:55	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/06/17 00:55	
Methylene Chloride	ug/L	ND	2.0	09/06/17 00:55	
Naphthalene	ug/L	ND	1.0	09/06/17 00:55	
o-Xylene	ug/L	ND	1.0	09/06/17 00:55	
p-Isopropyltoluene	ug/L	ND	1.0	09/06/17 00:55	
Styrene	ug/L	ND	1.0	09/06/17 00:55	
Tetrachloroethene	ug/L	ND	1.0	09/06/17 00:55	
Toluene	ug/L	ND	1.0	09/06/17 00:55	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/06/17 00:55	
trans-1,3-Dichloropropene	ug/L	ND	1.0	09/06/17 00:55	
Trichloroethene	ug/L	ND	1.0	09/06/17 00:55	
Trichlorofluoromethane	ug/L	ND	1.0	09/06/17 00:55	
Vinyl acetate	ug/L	ND	2.0	09/06/17 00:55	
Vinyl chloride	ug/L	ND	1.0	09/06/17 00:55	
Xylene (Total)	ug/L	ND	1.0	09/06/17 00:55	
1,2-Dichloroethane-d4 (S)	%	96	70-130	09/06/17 00:55	
4-Bromofluorobenzene (S)	%	101	70-130	09/06/17 00:55	
Toluene-d8 (S)	%	107	70-130	09/06/17 00:55	

LABORATORY CONTROL SAMPLE: 2085198

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	45.5	91	70-130	
1,1,1-Trichloroethane	ug/L	50	46.2	92	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.7	95	70-130	
1,1,2-Trichloroethane	ug/L	50	49.1	98	70-130	
1,1-Dichloroethane	ug/L	50	44.9	90	70-130	
1,1-Dichloroethene	ug/L	50	44.4	89	70-132	
1,1-Dichloropropene	ug/L	50	49.0	98	70-130	
1,2,3-Trichlorobenzene	ug/L	50	51.4	103	70-135	
1,2,3-Trichloropropane	ug/L	50	46.4	93	70-130	
1,2,4-Trichlorobenzene	ug/L	50	49.7	99	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	52.3	105	70-130	
1,2-Dichlorobenzene	ug/L	50	49.0	98	70-130	
1,2-Dichloroethane	ug/L	50	44.1	88	70-130	
1,2-Dichloropropane	ug/L	50	49.9	100	70-130	
1,3-Dichlorobenzene	ug/L	50	48.9	98	70-130	
1,3-Dichloropropane	ug/L	50	50.8	102	70-130	
1,4-Dichlorobenzene	ug/L	50	49.4	99	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

LABORATORY CONTROL SAMPLE: 2085198

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	41.2	82	58-145	
2-Butanone (MEK)	ug/L	100	90.8	91	70-145	
2-Chlorotoluene	ug/L	50	47.6	95	70-130	
2-Hexanone	ug/L	100	94.9	95	70-144	
4-Chlorotoluene	ug/L	50	48.2	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	95.6	96	70-140	
Acetone	ug/L	100	89.9	90	50-175	
Benzene	ug/L	50	48.0	96	70-130	
Bromobenzene	ug/L	50	50.5	101	70-130	
Bromochloromethane	ug/L	50	48.0	96	70-130	
Bromodichloromethane	ug/L	50	46.7	93	70-130	
Bromoform	ug/L	50	42.2	84	70-130	
Bromomethane	ug/L	50	53.7	107	54-130	
Carbon tetrachloride	ug/L	50	48.1	96	70-132	
Chlorobenzene	ug/L	50	48.0	96	70-130	
Chloroethane	ug/L	50	43.3	87	64-134	
Chloroform	ug/L	50	44.7	89	70-130	
Chloromethane	ug/L	50	49.3	99	64-130	
cis-1,2-Dichloroethene	ug/L	50	45.2	90	70-131	
cis-1,3-Dichloropropene	ug/L	50	51.8	104	70-130	
Dibromochloromethane	ug/L	50	46.3	93	70-130	
Dibromomethane	ug/L	50	47.8	96	70-131	
Dichlorodifluoromethane	ug/L	50	43.7	87	56-130	
Diisopropyl ether	ug/L	50	51.1	102	70-130	
Ethylbenzene	ug/L	50	47.7	95	70-130	
Hexachloro-1,3-butadiene	ug/L	50	46.6	93	70-130	
m&p-Xylene	ug/L	100	93.6	94	70-130	
Methyl-tert-butyl ether	ug/L	50	52.1	104	70-130	
Methylene Chloride	ug/L	50	46.7	93	63-130	
Naphthalene	ug/L	50	51.6	103	70-138	
o-Xylene	ug/L	50	46.9	94	70-130	
p-Isopropyltoluene	ug/L	50	49.1	98	70-130	
Styrene	ug/L	50	48.1	96	70-130	
Tetrachloroethene	ug/L	50	47.4	95	70-130	
Toluene	ug/L	50	47.5	95	70-130	
trans-1,2-Dichloroethene	ug/L	50	44.9	90	70-130	
trans-1,3-Dichloropropene	ug/L	50	45.7	91	70-132	
Trichloroethene	ug/L	50	51.0	102	70-130	
Trichlorofluoromethane	ug/L	50	45.6	91	62-133	
Vinyl acetate	ug/L	100	101	101	66-157	
Vinyl chloride	ug/L	50	44.9	90	50-150	
Xylene (Total)	ug/L	150	140	94	70-130	
1,2-Dichloroethane-d4 (S)	%			90	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			96	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE SAMPLE: 2085199

Parameter	Units	92353767001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.8	99	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.1	115	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.1	100	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.2	101	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.9	114	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.4	117	70-166	
1,1-Dichloropropene	ug/L	ND	20	23.7	118	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	21.8	109	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	20.1	101	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	21.3	106	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	19.6	98	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	21.7	108	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.1	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.5	107	70-130	
1,2-Dichloropropane	ug/L	ND	20	23.6	118	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
1,3-Dichloropropane	ug/L	ND	20	21.7	108	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.1	105	70-130	
2,2-Dichloropropane	ug/L	ND	20	18.5	93	70-130	
2-Butanone (MEK)	ug/L	ND	40	38.8	97	70-130	
2-Chlorotoluene	ug/L	ND	20	20.8	104	70-130	
2-Hexanone	ug/L	ND	40	38.5	96	70-130	
4-Chlorotoluene	ug/L	ND	20	21.3	106	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40.5	101	70-130	
Acetone	ug/L	ND	40	49.3	123	70-130	
Benzene	ug/L	ND	20	22.8	114	70-148	
Bromobenzene	ug/L	ND	20	21.5	108	70-130	
Bromochloromethane	ug/L	ND	20	23.4	117	70-130	
Bromodichloromethane	ug/L	ND	20	21.3	107	70-130	
Bromoform	ug/L	ND	20	19.2	96	70-130	
Bromomethane	ug/L	ND	20	24.0	120	70-130	
Carbon tetrachloride	ug/L	ND	20	23.5	117	70-130	
Chlorobenzene	ug/L	ND	20	21.9	109	70-146	
Chloroethane	ug/L	ND	20	23.6	118	70-130	
Chloroform	ug/L	ND	20	23.0	115	70-130	
Chloromethane	ug/L	ND	20	27.2	136	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	22.3	111	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	21.8	109	70-130	
Dibromochloromethane	ug/L	ND	20	20.3	101	70-130	
Dibromomethane	ug/L	ND	20	21.6	108	70-130	
Dichlorodifluoromethane	ug/L	ND	20	22.4	112	70-130	
Diisopropyl ether	ug/L	ND	20	22.3	112	70-130	
Ethylbenzene	ug/L	ND	20	22.2	111	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.2	106	70-130	
m&p-Xylene	ug/L	ND	40	43.3	108	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	20.9	104	70-130	
Methylene Chloride	ug/L	ND	20	20.7	104	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE SAMPLE: 2085199

Parameter	Units	92353767001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	21.2	106	70-130	
o-Xylene	ug/L	ND	20	21.2	106	70-130	
p-Isopropyltoluene	ug/L	ND	20	21.5	107	70-130	
Styrene	ug/L	ND	20	21.8	109	70-130	
Tetrachloroethene	ug/L	ND	20	21.3	107	70-130	
Toluene	ug/L	ND	20	22.4	112	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.8	114	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.1	96	70-130	
Trichloroethene	ug/L	ND	20	23.5	117	69-151	
Trichlorofluoromethane	ug/L	ND	20	24.1	121	70-130	
Vinyl acetate	ug/L	ND	40	27.4	69	70-130	M1
Vinyl chloride	ug/L	ND	20	24.1	120	70-130	
1,2-Dichloroethane-d4 (S)	%				99	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				101	70-130	

SAMPLE DUPLICATE: 2085200

Parameter	Units	92353767002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Benzene	ug/L	1.4	1.5	10	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

SAMPLE DUPLICATE: 2085200

Parameter	Units	92353767002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Diisopropyl ether	ug/L	ND	ND		30	
Ethylbenzene	ug/L	2.2	2.4	9	30	
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
m&p-Xylene	ug/L	5.0	7.0	33	30	D6
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	.44J		30	
o-Xylene	ug/L	6.1	6.4	5	30	
p-Isopropyltoluene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	12.3	14.9	20	30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	11.1	13.4	19	30	
1,2-Dichloroethane-d4 (S)	%	101	98	3		
4-Bromofluorobenzene (S)	%	101	102	0		
Toluene-d8 (S)	%	105	105	0		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

QC Batch: 376383 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92353809003, 92353809004, 92353809005

METHOD BLANK: 2085202 Matrix: Water
Associated Lab Samples: 92353809003, 92353809004, 92353809005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,1-Dichloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,1-Dichloroethene	ug/L	ND	1.0	09/06/17 01:12	
1,1-Dichloropropene	ug/L	ND	1.0	09/06/17 01:12	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
1,2,3-Trichloropropane	ug/L	ND	1.0	09/06/17 01:12	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	09/06/17 01:12	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/06/17 01:12	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
1,2-Dichloroethane	ug/L	ND	1.0	09/06/17 01:12	
1,2-Dichloropropane	ug/L	ND	1.0	09/06/17 01:12	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
1,3-Dichloropropane	ug/L	ND	1.0	09/06/17 01:12	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
2,2-Dichloropropane	ug/L	ND	1.0	09/06/17 01:12	
2-Butanone (MEK)	ug/L	ND	5.0	09/06/17 01:12	
2-Chlorotoluene	ug/L	ND	1.0	09/06/17 01:12	
2-Hexanone	ug/L	ND	5.0	09/06/17 01:12	
4-Chlorotoluene	ug/L	ND	1.0	09/06/17 01:12	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/06/17 01:12	
Acetone	ug/L	ND	25.0	09/06/17 01:12	
Benzene	ug/L	ND	1.0	09/06/17 01:12	
Bromobenzene	ug/L	ND	1.0	09/06/17 01:12	
Bromochloromethane	ug/L	ND	1.0	09/06/17 01:12	
Bromodichloromethane	ug/L	ND	1.0	09/06/17 01:12	
Bromoform	ug/L	ND	1.0	09/06/17 01:12	
Bromomethane	ug/L	ND	2.0	09/06/17 01:12	
Carbon tetrachloride	ug/L	ND	1.0	09/06/17 01:12	
Chlorobenzene	ug/L	ND	1.0	09/06/17 01:12	
Chloroethane	ug/L	ND	1.0	09/06/17 01:12	
Chloroform	ug/L	ND	1.0	09/06/17 01:12	
Chloromethane	ug/L	ND	1.0	09/06/17 01:12	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/06/17 01:12	
cis-1,3-Dichloropropene	ug/L	ND	1.0	09/06/17 01:12	
Dibromochloromethane	ug/L	ND	1.0	09/06/17 01:12	
Dibromomethane	ug/L	ND	1.0	09/06/17 01:12	
Dichlorodifluoromethane	ug/L	ND	1.0	09/06/17 01:12	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

METHOD BLANK: 2085202 Matrix: Water
Associated Lab Samples: 92353809003, 92353809004, 92353809005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	09/06/17 01:12	
Ethylbenzene	ug/L	ND	1.0	09/06/17 01:12	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	09/06/17 01:12	
m&p-Xylene	ug/L	ND	2.0	09/06/17 01:12	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/06/17 01:12	
Methylene Chloride	ug/L	ND	2.0	09/06/17 01:12	
Naphthalene	ug/L	ND	1.0	09/06/17 01:12	
o-Xylene	ug/L	ND	1.0	09/06/17 01:12	
p-Isopropyltoluene	ug/L	ND	1.0	09/06/17 01:12	
Styrene	ug/L	ND	1.0	09/06/17 01:12	
Tetrachloroethene	ug/L	ND	1.0	09/06/17 01:12	
Toluene	ug/L	ND	1.0	09/06/17 01:12	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/06/17 01:12	
trans-1,3-Dichloropropene	ug/L	ND	1.0	09/06/17 01:12	
Trichloroethene	ug/L	ND	1.0	09/06/17 01:12	
Trichlorofluoromethane	ug/L	ND	1.0	09/06/17 01:12	
Vinyl acetate	ug/L	ND	2.0	09/06/17 01:12	
Vinyl chloride	ug/L	ND	1.0	09/06/17 01:12	
Xylene (Total)	ug/L	ND	1.0	09/06/17 01:12	
1,2-Dichloroethane-d4 (S)	%	101	70-130	09/06/17 01:12	
4-Bromofluorobenzene (S)	%	101	70-130	09/06/17 01:12	
Toluene-d8 (S)	%	105	70-130	09/06/17 01:12	

LABORATORY CONTROL SAMPLE: 2085203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.4	93	70-130	
1,1,1-Trichloroethane	ug/L	50	48.6	97	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.4	95	70-130	
1,1,2-Trichloroethane	ug/L	50	48.8	98	70-130	
1,1-Dichloroethane	ug/L	50	46.2	92	70-130	
1,1-Dichloroethene	ug/L	50	43.9	88	70-132	
1,1-Dichloropropene	ug/L	50	50.6	101	70-130	
1,2,3-Trichlorobenzene	ug/L	50	52.1	104	70-135	
1,2,3-Trichloropropane	ug/L	50	47.0	94	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.9	102	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	47.8	96	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	51.6	103	70-130	
1,2-Dichlorobenzene	ug/L	50	50.1	100	70-130	
1,2-Dichloroethane	ug/L	50	45.4	91	70-130	
1,2-Dichloropropane	ug/L	50	51.4	103	70-130	
1,3-Dichlorobenzene	ug/L	50	49.9	100	70-130	
1,3-Dichloropropane	ug/L	50	52.6	105	70-130	
1,4-Dichlorobenzene	ug/L	50	50.2	100	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

LABORATORY CONTROL SAMPLE: 2085203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	45.2	90	58-145	
2-Butanone (MEK)	ug/L	100	88.1	88	70-145	
2-Chlorotoluene	ug/L	50	48.3	97	70-130	
2-Hexanone	ug/L	100	94.4	94	70-144	
4-Chlorotoluene	ug/L	50	49.4	99	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.6	95	70-140	
Acetone	ug/L	100	87.4	87	50-175	
Benzene	ug/L	50	49.3	99	70-130	
Bromobenzene	ug/L	50	51.1	102	70-130	
Bromochloromethane	ug/L	50	49.9	100	70-130	
Bromodichloromethane	ug/L	50	47.2	94	70-130	
Bromoform	ug/L	50	43.1	86	70-130	
Bromomethane	ug/L	50	51.0	102	54-130	
Carbon tetrachloride	ug/L	50	49.8	100	70-132	
Chlorobenzene	ug/L	50	49.5	99	70-130	
Chloroethane	ug/L	50	45.2	90	64-134	
Chloroform	ug/L	50	46.7	93	70-130	
Chloromethane	ug/L	50	52.5	105	64-130	
cis-1,2-Dichloroethene	ug/L	50	45.9	92	70-131	
cis-1,3-Dichloropropene	ug/L	50	52.1	104	70-130	
Dibromochloromethane	ug/L	50	48.1	96	70-130	
Dibromomethane	ug/L	50	49.0	98	70-131	
Dichlorodifluoromethane	ug/L	50	45.5	91	56-130	
Diisopropyl ether	ug/L	50	52.0	104	70-130	
Ethylbenzene	ug/L	50	48.8	98	70-130	
Hexachloro-1,3-butadiene	ug/L	50	46.8	94	70-130	
m&p-Xylene	ug/L	100	95.3	95	70-130	
Methyl-tert-butyl ether	ug/L	50	51.9	104	70-130	
Methylene Chloride	ug/L	50	48.0	96	63-130	
Naphthalene	ug/L	50	53.3	107	70-138	
o-Xylene	ug/L	50	48.3	97	70-130	
p-Isopropyltoluene	ug/L	50	50.2	100	70-130	
Styrene	ug/L	50	49.5	99	70-130	
Tetrachloroethene	ug/L	50	47.9	96	70-130	
Toluene	ug/L	50	48.2	96	70-130	
trans-1,2-Dichloroethene	ug/L	50	46.7	93	70-130	
trans-1,3-Dichloropropene	ug/L	50	45.7	91	70-132	
Trichloroethene	ug/L	50	52.7	105	70-130	
Trichlorofluoromethane	ug/L	50	47.5	95	62-133	
Vinyl acetate	ug/L	100	101	101	66-157	
Vinyl chloride	ug/L	50	47.8	96	50-150	
Xylene (Total)	ug/L	150	144	96	70-130	
1,2-Dichloroethane-d4 (S)	%			92	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			94	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2085204 2085205

Parameter	Units	92353809005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	40	40	39.6	38.6	99	97	70-130	2	30	
1,1,1-Trichloroethane	ug/L	11.2	40	40	57.5	58.1	116	117	70-130	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	40	40.8	39.1	102	98	70-130	4	30	
1,1,2-Trichloroethane	ug/L	ND	40	40	41.5	41.0	104	103	70-130	1	30	
1,1-Dichloroethane	ug/L	42.4	40	40	79.5	82.9	93	101	70-130	4	30	
1,1-Dichloroethene	ug/L	306	40	40	298	305	-21	-3	70-166	2	30	M1
1,1-Dichloropropene	ug/L	ND	40	40	47.6	47.9	119	120	70-130	0	30	
1,2,3-Trichlorobenzene	ug/L	ND	40	40	39.1	43.0	98	107	70-130	10	30	
1,2,3-Trichloropropane	ug/L	ND	40	40	39.1	39.6	98	99	70-130	1	30	
1,2,4-Trichlorobenzene	ug/L	ND	40	40	38.3	41.8	96	105	70-130	9	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	40	40	35.2	38.3	88	96	70-130	8	30	
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	42.3	42.0	106	105	70-130	1	30	
1,2-Dichlorobenzene	ug/L	ND	40	40	41.9	41.3	105	103	70-130	1	30	
1,2-Dichloroethane	ug/L	2.7	40	40	44.3	43.8	104	103	70-130	1	30	
1,2-Dichloropropane	ug/L	ND	40	40	43.1	45.1	108	113	70-130	4	30	
1,3-Dichlorobenzene	ug/L	ND	40	40	42.4	43.5	106	109	70-130	3	30	
1,3-Dichloropropane	ug/L	ND	40	40	43.4	42.2	109	105	70-130	3	30	
1,4-Dichlorobenzene	ug/L	ND	40	40	42.0	42.4	105	106	70-130	1	30	
2,2-Dichloropropane	ug/L	ND	40	40	34.4	37.7	86	94	70-130	9	30	
2-Butanone (MEK)	ug/L	ND	80	80	75.8	79.4	95	99	70-130	5	30	
2-Chlorotoluene	ug/L	ND	40	40	42.4	43.3	106	108	70-130	2	30	
2-Hexanone	ug/L	ND	80	80	73.2	73.6	91	92	70-130	1	30	
4-Chlorotoluene	ug/L	ND	40	40	43.0	43.2	108	108	70-130	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	80	80	77.8	78.1	97	98	70-130	0	30	
Acetone	ug/L	ND	80	80	72.8	74.1	91	93	70-130	2	30	
Benzene	ug/L	ND	40	40	45.0	44.0	112	110	70-148	2	30	
Bromobenzene	ug/L	ND	40	40	43.0	43.2	107	108	70-130	1	30	
Bromochloromethane	ug/L	ND	40	40	45.9	46.0	115	115	70-130	0	30	
Bromodichloromethane	ug/L	ND	40	40	41.6	42.3	104	106	70-130	2	30	
Bromoform	ug/L	ND	40	40	37.4	36.5	93	91	70-130	2	30	
Bromomethane	ug/L	ND	40	40	42.3	47.4	106	119	70-130	12	30	
Carbon tetrachloride	ug/L	ND	40	40	44.9	46.7	112	117	70-130	4	30	
Chlorobenzene	ug/L	ND	40	40	44.8	43.3	112	108	70-146	3	30	
Chloroethane	ug/L	ND	40	40	45.0	45.9	113	115	70-130	2	30	
Chloroform	ug/L	ND	40	40	44.1	42.7	110	106	70-130	3	30	
Chloromethane	ug/L	ND	40	40	51.7	52.8	129	132	70-130	2	30	M1
cis-1,2-Dichloroethene	ug/L	ND	40	40	45.9	46.0	111	111	70-130	0	30	
cis-1,3-Dichloropropene	ug/L	ND	40	40	40.9	40.8	102	102	70-130	0	30	
Dibromochloromethane	ug/L	ND	40	40	39.4	39.0	99	98	70-130	1	30	
Dibromomethane	ug/L	ND	40	40	41.7	42.9	104	107	70-130	3	30	
Dichlorodifluoromethane	ug/L	ND	40	40	42.3	43.4	106	108	70-130	2	30	
Diisopropyl ether	ug/L	ND	40	40	41.5	42.8	104	107	70-130	3	30	
Ethylbenzene	ug/L	ND	40	40	44.1	43.8	110	110	70-130	1	30	
Hexachloro-1,3-butadiene	ug/L	ND	40	40	38.8	43.5	97	109	70-130	11	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2085204 2085205

Parameter	Units	92353809005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
m&p-Xylene	ug/L	ND	80	80	87.8	85.8	110	107	70-130	2	30	
Methyl-tert-butyl ether	ug/L	ND	40	40	40.7	40.0	102	100	70-130	2	30	
Methylene Chloride	ug/L	ND	40	40	48.7	50.3	122	126	70-130	3	30	
Naphthalene	ug/L	ND	40	40	38.0	41.0	95	102	70-130	8	30	
o-Xylene	ug/L	ND	40	40	43.4	42.1	109	105	70-130	3	30	
p-Isopropyltoluene	ug/L	ND	40	40	42.0	43.2	105	108	70-130	3	30	
Styrene	ug/L	ND	40	40	43.3	41.2	108	103	70-130	5	30	
Tetrachloroethene	ug/L	ND	40	40	43.7	42.8	109	107	70-130	2	30	
Toluene	ug/L	ND	40	40	44.0	44.4	110	111	70-155	1	30	
trans-1,2-Dichloroethene	ug/L	ND	40	40	44.7	45.8	112	114	70-130	2	30	
trans-1,3-Dichloropropene	ug/L	ND	40	40	35.4	35.6	89	89	70-130	1	30	
Trichloroethene	ug/L	ND	40	40	49.3	48.1	119	117	69-151	2	30	
Trichlorofluoromethane	ug/L	ND	40	40	46.7	46.8	117	117	70-130	0	30	
Vinyl acetate	ug/L	ND	80	80	73.6	71.2	92	89	70-130	3	30	
Vinyl chloride	ug/L	ND	40	40	47.3	48.1	118	120	70-130	2	30	
1,2-Dichloroethane-d4 (S)	%						95	96	70-130			
4-Bromofluorobenzene (S)	%						102	100	70-130			
Toluene-d8 (S)	%						98	99	70-130			

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

QC Batch: 376699 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92353809001, 92353809002, 92353809006

METHOD BLANK: 2087105 Matrix: Water
Associated Lab Samples: 92353809001, 92353809002, 92353809006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,1,1-Trichloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,1,2-Trichloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,1-Dichloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,1-Dichloroethene	ug/L	ND	1.0	09/07/17 14:13	
1,1-Dichloropropene	ug/L	ND	1.0	09/07/17 14:13	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
1,2,3-Trichloropropane	ug/L	ND	1.0	09/07/17 14:13	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
1,2-Dibromo-3-chloropropane	ug/L	ND	2.0	09/07/17 14:13	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	09/07/17 14:13	
1,2-Dichlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
1,2-Dichloroethane	ug/L	ND	1.0	09/07/17 14:13	
1,2-Dichloropropane	ug/L	ND	1.0	09/07/17 14:13	
1,3-Dichlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
1,3-Dichloropropane	ug/L	ND	1.0	09/07/17 14:13	
1,4-Dichlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
2,2-Dichloropropane	ug/L	ND	1.0	09/07/17 14:13	
2-Butanone (MEK)	ug/L	ND	5.0	09/07/17 14:13	
2-Chlorotoluene	ug/L	ND	1.0	09/07/17 14:13	
2-Hexanone	ug/L	ND	5.0	09/07/17 14:13	
4-Chlorotoluene	ug/L	ND	1.0	09/07/17 14:13	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	09/07/17 14:13	
Acetone	ug/L	ND	25.0	09/07/17 14:13	
Benzene	ug/L	ND	1.0	09/07/17 14:13	
Bromobenzene	ug/L	ND	1.0	09/07/17 14:13	
Bromochloromethane	ug/L	ND	1.0	09/07/17 14:13	
Bromodichloromethane	ug/L	ND	1.0	09/07/17 14:13	
Bromoform	ug/L	ND	1.0	09/07/17 14:13	
Bromomethane	ug/L	ND	2.0	09/07/17 14:13	
Carbon tetrachloride	ug/L	ND	1.0	09/07/17 14:13	
Chlorobenzene	ug/L	ND	1.0	09/07/17 14:13	
Chloroethane	ug/L	ND	1.0	09/07/17 14:13	
Chloroform	ug/L	ND	1.0	09/07/17 14:13	
Chloromethane	ug/L	ND	1.0	09/07/17 14:13	
cis-1,2-Dichloroethene	ug/L	ND	1.0	09/07/17 14:13	
cis-1,3-Dichloropropene	ug/L	ND	1.0	09/07/17 14:13	
Dibromochloromethane	ug/L	ND	1.0	09/07/17 14:13	
Dibromomethane	ug/L	ND	1.0	09/07/17 14:13	
Dichlorodifluoromethane	ug/L	ND	1.0	09/07/17 14:13	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

METHOD BLANK: 2087105 Matrix: Water
Associated Lab Samples: 92353809001, 92353809002, 92353809006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	ND	1.0	09/07/17 14:13	
Ethylbenzene	ug/L	ND	1.0	09/07/17 14:13	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	09/07/17 14:13	
m&p-Xylene	ug/L	ND	2.0	09/07/17 14:13	
Methyl-tert-butyl ether	ug/L	ND	1.0	09/07/17 14:13	
Methylene Chloride	ug/L	ND	2.0	09/07/17 14:13	
Naphthalene	ug/L	ND	1.0	09/07/17 14:13	
o-Xylene	ug/L	ND	1.0	09/07/17 14:13	
p-Isopropyltoluene	ug/L	ND	1.0	09/07/17 14:13	
Styrene	ug/L	ND	1.0	09/07/17 14:13	
Tetrachloroethene	ug/L	ND	1.0	09/07/17 14:13	
Toluene	ug/L	ND	1.0	09/07/17 14:13	
trans-1,2-Dichloroethene	ug/L	ND	1.0	09/07/17 14:13	
trans-1,3-Dichloropropene	ug/L	ND	1.0	09/07/17 14:13	
Trichloroethene	ug/L	ND	1.0	09/07/17 14:13	
Trichlorofluoromethane	ug/L	ND	1.0	09/07/17 14:13	
Vinyl acetate	ug/L	ND	2.0	09/07/17 14:13	
Vinyl chloride	ug/L	ND	1.0	09/07/17 14:13	
Xylene (Total)	ug/L	ND	1.0	09/07/17 14:13	
1,2-Dichloroethane-d4 (S)	%	102	70-130	09/07/17 14:13	
4-Bromofluorobenzene (S)	%	102	70-130	09/07/17 14:13	
Toluene-d8 (S)	%	106	70-130	09/07/17 14:13	

LABORATORY CONTROL SAMPLE: 2087106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	45.5	91	70-130	
1,1,1-Trichloroethane	ug/L	50	48.8	98	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	48.0	96	70-130	
1,1,2-Trichloroethane	ug/L	50	49.5	99	70-130	
1,1-Dichloroethane	ug/L	50	46.9	94	70-130	
1,1-Dichloroethene	ug/L	50	43.9	88	70-132	
1,1-Dichloropropene	ug/L	50	51.6	103	70-130	
1,2,3-Trichlorobenzene	ug/L	50	51.7	103	70-135	
1,2,3-Trichloropropane	ug/L	50	48.1	96	70-130	
1,2,4-Trichlorobenzene	ug/L	50	50.7	101	70-134	
1,2-Dibromo-3-chloropropane	ug/L	50	46.8	94	70-130	
1,2-Dibromoethane (EDB)	ug/L	50	50.9	102	70-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	70-130	
1,2-Dichloroethane	ug/L	50	46.9	94	70-130	
1,2-Dichloropropane	ug/L	50	51.3	103	70-130	
1,3-Dichlorobenzene	ug/L	50	48.9	98	70-130	
1,3-Dichloropropane	ug/L	50	51.4	103	70-130	
1,4-Dichlorobenzene	ug/L	50	49.1	98	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

LABORATORY CONTROL SAMPLE: 2087106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,2-Dichloropropane	ug/L	50	50.1	100	58-145	
2-Butanone (MEK)	ug/L	100	103	103	70-145	
2-Chlorotoluene	ug/L	50	46.8	94	70-130	
2-Hexanone	ug/L	100	101	101	70-144	
4-Chlorotoluene	ug/L	50	48.5	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.5	99	70-140	
Acetone	ug/L	100	107	107	50-175	
Benzene	ug/L	50	50.4	101	70-130	
Bromobenzene	ug/L	50	49.3	99	70-130	
Bromochloromethane	ug/L	50	49.1	98	70-130	
Bromodichloromethane	ug/L	50	48.3	97	70-130	
Bromoform	ug/L	50	42.7	85	70-130	
Bromomethane	ug/L	50	53.7	107	54-130	
Carbon tetrachloride	ug/L	50	50.0	100	70-132	
Chlorobenzene	ug/L	50	48.0	96	70-130	
Chloroethane	ug/L	50	46.2	92	64-134	
Chloroform	ug/L	50	46.7	93	70-130	
Chloromethane	ug/L	50	53.0	106	64-130	
cis-1,2-Dichloroethene	ug/L	50	47.4	95	70-131	
cis-1,3-Dichloropropene	ug/L	50	53.0	106	70-130	
Dibromochloromethane	ug/L	50	46.5	93	70-130	
Dibromomethane	ug/L	50	49.0	98	70-131	
Dichlorodifluoromethane	ug/L	50	44.5	89	56-130	
Diisopropyl ether	ug/L	50	52.6	105	70-130	
Ethylbenzene	ug/L	50	48.3	97	70-130	
Hexachloro-1,3-butadiene	ug/L	50	48.6	97	70-130	
m&p-Xylene	ug/L	100	94.7	95	70-130	
Methyl-tert-butyl ether	ug/L	50	53.2	106	70-130	
Methylene Chloride	ug/L	50	48.3	97	63-130	
Naphthalene	ug/L	50	50.9	102	70-138	
o-Xylene	ug/L	50	47.4	95	70-130	
p-Isopropyltoluene	ug/L	50	49.8	100	70-130	
Styrene	ug/L	50	49.9	100	70-130	
Tetrachloroethene	ug/L	50	48.0	96	70-130	
Toluene	ug/L	50	48.5	97	70-130	
trans-1,2-Dichloroethene	ug/L	50	47.2	94	70-130	
trans-1,3-Dichloropropene	ug/L	50	47.9	96	70-132	
Trichloroethene	ug/L	50	51.8	104	70-130	
Trichlorofluoromethane	ug/L	50	48.5	97	62-133	
Vinyl acetate	ug/L	100	106	106	66-157	
Vinyl chloride	ug/L	50	46.6	93	50-150	
Xylene (Total)	ug/L	150	142	95	70-130	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE SAMPLE: 2088067

Parameter	Units	92353757010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	16.8	84	70-130	
1,1,1-Trichloroethane	ug/L	13.1	20	35.0	109	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	16.9	85	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	18.3	91	70-130	
1,1-Dichloroethane	ug/L	16.4	20	35.4	95	70-130	
1,1-Dichloroethene	ug/L	68.4	20	81.0	63	70-166	M1
1,1-Dichloropropene	ug/L	ND	20	20.9	105	70-130	
1,2,3-Trichlorobenzene	ug/L	ND	20	17.7	88	70-130	
1,2,3-Trichloropropane	ug/L	ND	20	17.2	86	70-130	
1,2,4-Trichlorobenzene	ug/L	ND	20	17.4	87	70-130	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	16.7	84	70-130	
1,2-Dibromoethane (EDB)	ug/L	ND	20	18.4	92	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	17.5	88	70-130	
1,2-Dichloroethane	ug/L	ND	20	19.7	94	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.0	100	70-130	
1,3-Dichlorobenzene	ug/L	ND	20	17.9	89	70-130	
1,3-Dichloropropane	ug/L	ND	20	18.6	93	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	18.0	90	70-130	
2,2-Dichloropropane	ug/L	ND	20	20.8	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	35.4	89	70-130	
2-Chlorotoluene	ug/L	ND	20	17.9	89	70-130	
2-Hexanone	ug/L	ND	40	34.4	86	70-130	
4-Chlorotoluene	ug/L	ND	20	18.0	90	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	33.9	85	70-130	
Acetone	ug/L	ND	40	33.7	84	70-130	
Benzene	ug/L	ND	20	20.3	98	70-148	
Bromobenzene	ug/L	ND	20	18.7	93	70-130	
Bromochloromethane	ug/L	ND	20	19.4	97	70-130	
Bromodichloromethane	ug/L	ND	20	18.9	94	70-130	
Bromoform	ug/L	ND	20	16.0	80	70-130	
Bromomethane	ug/L	ND	20	25.0	125	70-130	
Carbon tetrachloride	ug/L	ND	20	19.7	98	70-130	
Chlorobenzene	ug/L	ND	20	18.6	93	70-146	
Chloroethane	ug/L	ND	20	20.8	104	70-130	
Chloroform	ug/L	ND	20	19.9	100	70-130	
Chloromethane	ug/L	ND	20	23.7	119	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	19.8	99	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.6	93	70-130	
Dibromochloromethane	ug/L	ND	20	16.9	85	70-130	
Dibromomethane	ug/L	ND	20	18.8	94	70-130	
Dichlorodifluoromethane	ug/L	ND	20	18.5	92	70-130	
Diisopropyl ether	ug/L	ND	20	19.6	98	70-130	
Ethylbenzene	ug/L	ND	20	18.4	92	70-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	18.3	91	70-130	
m&p-Xylene	ug/L	ND	40	36.6	92	70-130	
Methyl-tert-butyl ether	ug/L	ND	20	19.5	94	70-130	
Methylene Chloride	ug/L	ND	20	18.5	93	70-130	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

MATRIX SPIKE SAMPLE: 2088067

Parameter	Units	92353757010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	ND	20	17.3	87	70-130	
o-Xylene	ug/L	ND	20	17.6	88	70-130	
p-Isopropyltoluene	ug/L	ND	20	18.3	92	70-130	
Styrene	ug/L	ND	20	18.0	90	70-130	
Tetrachloroethene	ug/L	ND	20	18.3	92	70-130	
Toluene	ug/L	ND	20	19.2	96	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	19.9	99	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	17.0	85	70-130	
Trichloroethene	ug/L	ND	20	21.0	105	69-151	
Trichlorofluoromethane	ug/L	ND	20	21.0	105	70-130	
Vinyl acetate	ug/L	ND	40	38.0	95	70-130	
Vinyl chloride	ug/L	ND	20	20.1	101	70-130	
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 2088068

Parameter	Units	92353725020 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	15J		30	
Benzene	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

SAMPLE DUPLICATE: 2088068

Parameter	Units	92353725020 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	.68J		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Diisopropyl ether	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
m&p-Xylene	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
o-Xylene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	3.9	4.0	1	30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	101	100	2		
Toluene-d8 (S)	%	106	108	2		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

QC Batch: 376646 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92353809001, 92353809002, 92353809003, 92353809004, 92353809005, 92353809006

METHOD BLANK: 2086712 Matrix: Water
Associated Lab Samples: 92353809001, 92353809002, 92353809003, 92353809004, 92353809005, 92353809006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	09/07/17 12:16	
1,2-Dichloroethane-d4 (S)	%	105	50-150	09/07/17 12:16	
Toluene-d8 (S)	%	104	50-150	09/07/17 12:16	

LABORATORY CONTROL SAMPLE: 2086713

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	17.6	88	71-125	
1,2-Dichloroethane-d4 (S)	%			104	50-150	
Toluene-d8 (S)	%			104	50-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2086714 2086715

Parameter	Units	92353809005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dioxane (p-Dioxane)	ug/L	149	50	50	169	187	39	77	50-150	11	30	M1
1,2-Dichloroethane-d4 (S)	%						114	111	50-150		150	
Toluene-d8 (S)	%						114	114	50-150		150	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

QC Batch: 377141 Analysis Method: EPA 8260B Mod.
QC Batch Method: EPA 8260B Mod. Analysis Description: 8260 MSV SIM
Associated Lab Samples: 92353809007

METHOD BLANK: 2089573 Matrix: Water
Associated Lab Samples: 92353809007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	ND	2.0	09/11/17 13:41	
1,2-Dichloroethane-d4 (S)	%	104	50-150	09/11/17 13:41	
Toluene-d8 (S)	%	106	50-150	09/11/17 13:41	

LABORATORY CONTROL SAMPLE: 2089574

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,4-Dioxane (p-Dioxane)	ug/L	20	20.2	101	71-125	
1,2-Dichloroethane-d4 (S)	%			95	50-150	
Toluene-d8 (S)	%			102	50-150	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

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

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: FORMER KOP-FLEX FACIL 31400390
Pace Project No.: 92353809

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92353809001	**RW-1S**	EPA 8260	376699		
92353809002	**RW-2S**	EPA 8260	376699		
92353809003	**RW-3S**	EPA 8260	376383		
92353809004	**RW-1D**	EPA 8260	376383		
92353809005	**RW-2D MS/MSD**	EPA 8260	376383		
92353809006	**RW-20D**	EPA 8260	376699		
92353809007	**TRIP BLANK**	EPA 8260	376382		
92353809001	**RW-1S**	EPA 8260B Mod.	376646		
92353809002	**RW-2S**	EPA 8260B Mod.	376646		
92353809003	**RW-3S**	EPA 8260B Mod.	376646		
92353809004	**RW-1D**	EPA 8260B Mod.	376646		
92353809005	**RW-2D MS/MSD**	EPA 8260B Mod.	376646		
92353809006	**RW-20D**	EPA 8260B Mod.	376646		
92353809007	**TRIP BLANK**	EPA 8260B Mod.	377141		

Pace Analytical	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 ☑

WO# : 92353809

92353809

Sample Condition Upon Receipt

Client Name: WSP **Project #:**

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: 9/1 LW

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☑ No ☐ N/A

Thermometer: ☑ IR Gun ID: T172

Correction Factor: **Cooler Temp Corrected (°C):** 5.1 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)
Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Lot ID of split containers: _____

Project Manager SCURF Review: PR **Date:** 9/1

Project Manager SRF Review: PR **Date:** 9/1

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)

*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# : 92353809

PM: PTE Due Date: 09/11/17

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 (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1	\				\	\	\	\			\		\	\	\	6												
2	\				\	\	\	\			\		\	\	\	6												
3	\				\	\	\	\			\		\	\	\	4												
4	\				\	\	\	\			\		\	\	\	6												
5	\				\	\	\	\			\		\	\	\	18												
6	\				\	\	\	\			\		\	\	\	4												
7	\				\	\	\	\			\		\	\	\	4												
8	\				\	\	\	\			\		\	\	\													
9	\				\	\	\	\			\		\	\	\													
10	\				\	\	\	\			\		\	\	\													
11	\				\	\	\	\			\		\	\	\													
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 #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WSP Environment and Energy	Report To:	Johnson, Eric	Attention:	
Address:	13530 Dulles Technology Drive	Copy To:		Company Name:	
Suite 300, Herndon, VA 20171				Address:	Regulatory Agency
Email:		Purchase Order #:		Pace Quote:	
Phone:	Fax	Project Name:	Former Kop-Flex Facility	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:	31400390	Pace Profile #:	4362-1

State / Location: MD

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	8260 SIM 1,4-Dioxane	Residual Chlorine (Y/N)	
1	RW-1S	W	G	8/31/17	0955	—	—		6				X							X	X		001
2	RW-2S	W	G	8/31/17	1013	—	—		6				X							X	X		002
3	RW-3S				1120				6				X							X	X		003
4	RW-1D				1135				6				X							X	X		004
5	RW-2D				1140				6				X							X	X		005
6	RW-2D-MS/MSD				1140				12				X							X	X		
7	RW-200				0900				6				X							X	X		006
8	Trip Blank												X							X	X		lab provided
9																							
10																							
11																							
12																							

92353809

8/31 ⇒

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		8/31/17	1900	Pace	9/1/17	1035	5.1	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Maria Kaplan

SIGNATURE of SAMPLER: [signature]

DATE Signed: 8/31/17

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)